



City of Charleston

South Carolina

Department of Public Service

JOHN J. TECKLENBURG
Mayor

LAURA S. CABINESS, PE
Director

**PUBLIC WORKS AND UTILITIES COMMITTEE
AGENDA**

There will be a meeting of the Public Works and Utilities Committee on Tuesday, January 24, 2017 to begin at 3:30 p.m. at Founders Hall, Charles Towne Landing. The following items will be heard:

A. Invocation

B. Approval of Public Works and Utilities Committee Minutes

December 6, 2016 – *DEFERRED*

December 20, 2016 – *DEFERRED*

January 10, 2017 – *DEFERRED*

C. Request to Set a Public Hearing

None

D. Acceptance and Dedication of Rights-of-Way and Easements

1. **Whitney Lake Phase 4** - Acceptance and dedication of Pole Cat Alley (25-foot right-of-way), Rose Mallow Alley (25-foot right-of-way), a portion of Celosia Alley (25-foot right-of-way), a portion of Sweetleaf Lane (55-foot right-of-way), and a portion of Sparkleberry Lane (variable width right-of-way). Sidewalk is bonded.

- a. Title to Real Estate
- b. Affidavit for Taxable or Exempt Transfers
- c. Plat (2)
- d. Exclusive Storm Water Drainage Easements

E. Requests for Permanent Encroachments

None

F. Temporary Encroachments Approved By The Department of Public Service (For information only)

None

G. Miscellaneous or Other New Business

1. Update on Stormwater Policy for grandfathered commercial developments.

Councilmember Rodney Williams
Chairperson

STATE OF SOUTH CAROLINA)
COUNTY OF CHARLESTON)
CITY OF CHARLESTON)

TITLE TO REAL ESTATE

KNOW ALL MEN BY THESE PRESENTS, that Sabal Homes at Whitney Lake, LLC ("Grantor") in the state aforesaid, for and in consideration of the sum of ONE AND 00/100 DOLLAR (\$1.00), being the true consideration to it in hand paid at and before the sealing of these presents by the CITY OF CHARLESTON, the receipt whereof is hereby acknowledged, has granted, bargained, sold and released, and by these presents does grant, bargain, sell and release unto the said CITY OF CHARLESTON ("Grantee"), its successors and assigns, forever, the following described property which is granted, bargained, sold and released for the use of the public forever:

All the of the property underneath, above, and containing those certain streets, roads, drives, and cul-de-sacs situate, lying and being in the City of Charleston, County of Charleston, State of South Carolina, located in Whitney Lake, Phase 4 as shown and designated on a plat entitled Subdivision & Property Line Abandonment Plat Showing the Subdivision of TMS No. 312-00-00-143 to Create Johnston Point at Whitney Lake Subdivision F.K.A. The Gardens at Whitney Lake Subdivision, Phase 4, Containing Lots 1 through 53, Road Right-of-Ways and HOA Areas Owned by Sabal Homes at Whitney Lake, LLC Located in the City of Charleston Charleston County, South Carolina prepared by Jonathan F. Burns, PLS, dated 12 July 2016, revised N/A, and recorded in Plat Book _____ at Page _____ in the RMC Office for CHARLESTON County. Said property butting and bounding, measuring and containing, and having such courses and distances as are shown on said plat. Reference being had to the aforesaid plat for a full and complete description, being all of the said dimensions, a little more or a little less.

This being a portion of the property conveyed to Grantor herein by deed of the Frazier Real Properties, L. P. dated October 24, 2015 and recorded in Book 0513 at Page 946 in the RMC Office for CHARLESTON County, South Carolina.

Grantee's Mailing Address:

City of Charleston
Department of Public Service
Engineering Division
75 Calhoun Street
Third Floor
Charleston, South Carolina 29401

TOGETHER with all and singular, the rights, members, hereditaments and appurtenances to the said premises belonging, or in anywise incident or appertaining.

TO HAVE AND TO HOLD, all and singular, the said premises before mentioned unto the CITY OF CHARLESTON, its successors and assigns forever.

AND we do hereby bind ourselves and our heirs, executors and administrators, to warrant and forever defend, all and singular, the said premises unto the said City of Charleston, heirs and assigns, against us and our heirs, and all persons whomsoever lawfully claiming, or to claim the same or any part thereof.

WITNESS our Hand(s) and Seal(s) this 29 day of SEPT. 2016.

SIGNED, SEALED AND DELIVERED
IN THE PRESENCE OF:

Grantor

Julia Jones
Witness Number One

Sabal Homes at Whitney Lake, LLC

Julia Jones
Printed Name

H. Matthew Jones
Printed Name

Elliott Locklair
Witness Number Two

ELLIOTT LOCKLAIR
Printed Name

STATE OF SOUTH CAROLINA)
COUNTY OF CHARLESTON)

PERSONALLY APPEARED before me the undersigned witness and made oath that (s)he saw the within named Sabal Homes at Whitney Lake, LLC, by its duly authorized officer H. Matthew Jones, sign, seal and as its act and deed, deliver the within written Deed, and that (s)he with the other witness witnessed the execution thereof.

Julia Jones

SWORN to before me this 29 day of Sept., 2016

Robert W. Locklair
NOTARY PUBLIC FOR SOUTH CAROLINA

MY COMMISSION EXPIRES: 25 Jan 17

STATE OF SOUTH CAROLINA)

COUNTY OF CHARLESTON) AFFIDAVIT FOR TAXABLE OR EXEMPT TRANSFERS

PERSONALLY appeared before me the undersigned, who being duly sworn, deposes and says:

1. I have read the information on this affidavit and I understand such information.
2. The property was transferred by Sabal Homes at Whitney Lake, LLC
to City of Charleston on _____.
3. Check one of the following: The deed is
 - (A) _____ subject to the deed recording fee as a transfer for consideration paid or to be paid in money or money's worth.
 - (B) _____ subject to the deed recording fee as a transfer between a corporation, a partnership, or other entity and a stockholder, partner, or owner of the entity, or is a transfer to a trust or as distribution to a trust beneficiary.
 - (C) ☒ exempt from the deed recording fee because (See Information section of affidavit): Exemption #1 and Exemption #2 (explanation required)
(If exempt, please skip items 4-7, and go to item 8 of this affidavit.)

If exempt under exemption #14 as described in the Information section of this affidavit, did the agent and principal relationship exist at the time of the original sale and was the purpose of this relationship to purchase the realty?

Check Yes ____ or No ____

4. Check one of the following if either item 3(a) or item 3(b) above has been checked. (See Information section of this affidavit):
 - (A) _____ The fee is computed on the consideration paid or to be paid in money or money's worth in the amount of _____
 - (B) _____ The fee is computed on the fair market value of the realty which is _____
 - (C) _____ The fee is computed on the fair market value of the realty as established for property tax purposes which is _____
5. Check YES ____ or NO ____ to the following: A lien or encumbrance existed on the land, tenement, or realty before the transfer and remained on the land, tenement, or realty after the transfer. If "YES," the amount of the outstanding balance of this lien or encumbrance is _____.
6. The deed recording fee is computed as follows:
 - (A) Place the amount listed in item 4 above here: _____
 - (B) Place the amount listed in item 5 above here: _____
(If no amount is listed, place zero here.)
 - (C) Subtract Line 6(b) from Line 6(a) and place the result here: _____

7. The deed recording fee is based on the amount listed on Line 6(c) above and the deed recording fee due is _____.
8. As required by Code Section '12-24-70, I state that I am a responsible person who was connected with the transaction as Managing Member.
9. I understand that a person required to furnish this affidavit who willfully furnishes a false or fraudulent affidavit is guilty of a misdemeanor and, upon conviction, must be fined not more than one thousand dollars or imprisoned not more than one year, or both.

M. Jones

Responsible Person Connected with the Transaction

R. Matthew Jones, Member

Print or Type Name Here

Sworn this 29 day of September 2016

Robert G. Williams
Notary Public for South Carolina

My Commission Expires: 25 January, 2017



VICINITY MAP (NTS)



FLOOD NOTE:
THIS PROPERTY IS LOCATED IN
FLOOD ZONE 1 AS SHOWN FROM
FEMA FLOOD MAPS, PANEL NO.
45019C 06601, REVISED 11/77/2004.

DEDICATION STATEMENT

BY THE RECORDING OF THIS PLAT, AND UPON APPROVAL AND ACCEPTANCE BY
THE CITY COUNCIL OF CHARLESTON, I HEREBY DEDICATE ALL ROADS,
RIGHTS-OF-WAY, AND EASEMENTS TO THE USE OF THE PUBLIC FOREVER.

OWNER OR REPRESENTATIVE

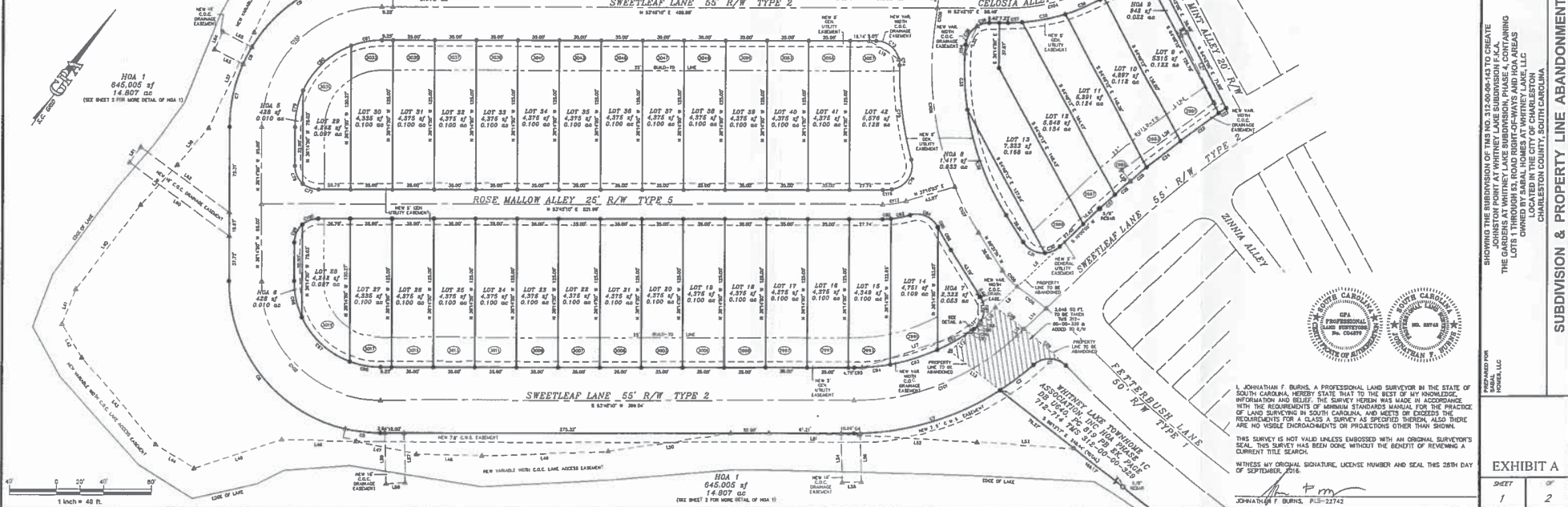
DATE

ABBREVIATIONS

C.C. = CITY OF CHARLESTON
C.W.S. = CHARLESTON WATER SYSTEM

LEGEND

- = IRON FOUND (AS DESCRIBED)
- △ = IRON SET (5/8" REBAR)
- = CALCULATED POINT
- = ADJUNCTION LINE
- = RIGHT-OF-WAY
- = CENTER LINE
- = PROPERTY LINE TO BE ABANDONED
- = EASEMENT LINE (AS DESCRIBED)
- = EASEMENT LINE (DRAINAGE)
- = BUILD-TO LINE
- = STREET ADDRESS



GPA
PROFESSIONAL
LAND SURVEYORS
EST. 1987
237 OLD SUMMERVILLE RD
SUMMERVILLE, SC 29483
OFFICE (843) 285-1424
GPA OF CHARLOTTE, INC.
605 PHILIP DAVID DRIVE
CHARLOTTE, NC 28226-8818
OFFICE (704) 335-8810
GPA OF RALEIGH, INC.
137 WEST AUSTIN
RALEIGH, NC 27603
CHARLESTON, SC 29403
OFFICE (843) 971-8099
FAX (843) 971-8092
"Integrity Without Boundaries"
www.gpaonline.com

SCALE
1"=40'
FILE NO. PC
JOB NO.
DATE 07/12/2016
DRAWN BY
CHECKED BY
RLG

SUBDIVISION & PROPERTY LINE ABANDONMENT PLAT
SHOWING THE SUBDIVISION OF THIS NO. 312-00-00-143 TO CREATE
JOHNSTON POINT AT WHITNEY LAKE SUBDIVISION F.C.A.
THE GRASERS AT WHITNEY LAKE SUBDIVISION, PHASE 1, CONTAINING
LOTS OWNED BY SARAL HOMES AT WHITNEY LAKE, LLC
LOCATED IN THE CITY OF CHARLESTON
CHARLESTON COUNTY, SOUTH CAROLINA

PREPARED FOR
SARAL HOMES, LLC
EXHIBIT A
SHEET 1 OF 2



VICINITY MAP (NTS)

RMC AND PLANNING USE ONLY

ACREAGE CHART

TOTAL AREA:	24,630 ACRES
TOTAL R/W AREA:	3,542 ACRES
TOTAL LOT AREA:	5,534 ACRES
TOTAL HOA AREA:	15,554 ACRES

REFERENCES:

1. A SUBDIVISION PLAT OF TRACT B TO CREATE PHASE 2 WHITNEY LAKE CONTAINING 53,311 ACRES, BY SOUTHEASTERN SURVEYING OF CHARLESTON, INC., DATED JULY 28, 2006 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 04, PAGE 48.
2. A SUBDIVISION PLAT AND BOUNDARY LINE ADJUSTMENT PLAT OF TRACTS B AND NO. 40 INTO PHASE 1A, PHASE 1B AND RESIDUAL TRACT B, BY SOUTHEASTERN SURVEYING OF CHARLESTON, INC., DATED APRIL 24, 2004 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 04, PAGE 312.
3. A BOUNDARY LINE ADJUSTMENT PLAT OF EXISTING PHASE 1B, OWNED BY THE LSC COMPANY AND A PORTION OF TRACT B, OWNED BY FRAZER REAL PROPERTY, LP, BY SOUTHEASTERN SURVEYING OF CHARLESTON, INC., DATED APRIL 15, 2006 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 04, PAGE 381.
4. FINAL SUBDIVISION PLAT OF THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED FEBRUARY 14, 2007, AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.
5. FINAL SUBDIVISION PLAT OF PHASE 1C THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED MAY 25, 2012, AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 04, PAGE 410.
6. FINAL SUBDIVISION PLAT OF PHASE 1D THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED NOVEMBER 27, 2006 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.
7. FINAL SUBDIVISION PLAT OF PHASE 1E THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED AUGUST 18, 2012 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.
8. FINAL SUBDIVISION PLAT OF PHASE 1F THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED OCTOBER 13, 2013 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.
9. FINAL SUBDIVISION PLAT OF PHASE 1G THE CARDBOARDS AT WHITNEY LAKE, BY THOMAS & HUTTON ENGINEERING CO., DATED JUNE 28, 2010 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.

DEVELOPER INFORMATION:

SABAL HOMES @ WHITNEY LAKE, LLC
C/O MATT JONES
421 WANDO PARK LANE, SUITE 230
MOUNT PLEASANT, SC 29464
mjones@sabalhomes.net
843-388-8483

FLOOD NOTE:

THIS PROPERTY IS LOCATED IN FLOOD ZONE X AS SHOWN FROM FEMA FLOOD MAPS, PANEL NO. 450106 0660, REVISED 11/17/2004.

NOTES:

1. AREA WAS DETERMINED BY THE COORDINATE METHOD.
2. ANYTHING SHOWN OUTSIDE THE DEFINED BOUNDARY IS FOR DESCRIPTIVE PURPOSES ONLY.
3. THE PUBLIC RECORDS REFERENCED ON THIS PLAT ARE ONLY USED AND/OR NECESSARY TO THE ESTABLISHMENT OF THE BOUNDARY OF THIS PROPERTY THEY ARE NOT AND DO NOT CONSTITUTE A TITLE SEARCH.
4. DISTANCE SHOWN HEREON ARE HORIZONTAL GROUND DISTANCES.
5. NO SURFACE OR ENVIRONMENTAL INVESTIGATION OR SURVEYS WERE PERFORMED FOR THIS PLAT. THEREFORE, THIS PLAT DOES NOT REFLECT THE EXISTENCE OR NONEXISTENCE OF UTILITIES, CONTAMINANT, OR OTHER CONDITIONS WHICH MAY AFFECT THIS PROPERTY. THERE ARE NO APPLICABLE CORRELATION LINE BUFFERS OR STRIPS ON THIS PROPERTY. NO LAND OR OTHER AREA IS DEDICATED FOR PUBLIC USE BY THIS PLAT UNLESS A DEDICATION IS EXPRESSLY STATED HEREON.
6. TOTAL NUMBER OF LOTS = 63. SMALLEST LOT IS LOT 53 = 3,402 SQ. FT. = 0.078 AC.
7. CURRENT ZONING IN NEIGHBORHOOD DISTRICT OVERLAY (NO. 4) IS 2013 AND RECORDED IN THE CHARLESTON COUNTY R/LC IN PLAT BOOK 13, PAGE 333.
8. PHASE 1A, PHASE 1B, PHASE 1C, PHASE 1D, PHASE 1E, PHASE 1F, PHASE 1G, PHASE 1H, PHASE 1I, PHASE 1J, PHASE 1K, PHASE 1L, PHASE 1M, PHASE 1N, PHASE 1O, PHASE 1P, PHASE 1Q, PHASE 1R, PHASE 1S, PHASE 1T, PHASE 1U, PHASE 1V, PHASE 1W, PHASE 1X, PHASE 1Y, PHASE 1Z, PHASE 1AA, PHASE 1AB, PHASE 1AC, PHASE 1AD, PHASE 1AE, PHASE 1AF, PHASE 1AG, PHASE 1AH, PHASE 1AI, PHASE 1AJ, PHASE 1AK, PHASE 1AL, PHASE 1AM, PHASE 1AN, PHASE 1AO, PHASE 1AP, PHASE 1AQ, PHASE 1AR, PHASE 1AS, PHASE 1AT, PHASE 1AU, PHASE 1AV, PHASE 1AW, PHASE 1AX, PHASE 1AY, PHASE 1AZ, PHASE 1BA, PHASE 1BB, PHASE 1BC, PHASE 1BD, PHASE 1BE, PHASE 1BF, PHASE 1BG, PHASE 1BH, PHASE 1BI, PHASE 1BJ, PHASE 1BK, PHASE 1BL, PHASE 1BM, PHASE 1BN, PHASE 1BO, PHASE 1BP, PHASE 1BQ, PHASE 1BR, PHASE 1BS, PHASE 1BT, PHASE 1BU, PHASE 1BV, PHASE 1BW, PHASE 1BX, PHASE 1BY, PHASE 1BZ, PHASE 1CA, PHASE 1CB, PHASE 1CC, PHASE 1CD, PHASE 1CE, PHASE 1CF, PHASE 1CG, PHASE 1CH, PHASE 1CI, PHASE 1CJ, PHASE 1CK, PHASE 1CL, PHASE 1CM, PHASE 1CN, PHASE 1CO, PHASE 1CP, PHASE 1CQ, PHASE 1CR, PHASE 1CS, PHASE 1CT, PHASE 1CU, PHASE 1CV, PHASE 1CW, PHASE 1CX, PHASE 1CY, PHASE 1CZ, PHASE 1DA, PHASE 1DB, PHASE 1DC, PHASE 1DD, PHASE 1DE, PHASE 1DF, PHASE 1DG, PHASE 1DH, PHASE 1DI, PHASE 1DJ, PHASE 1DK, PHASE 1DL, PHASE 1DM, PHASE 1DN, PHASE 1DO, PHASE 1DP, PHASE 1DQ, PHASE 1DR, PHASE 1DS, PHASE 1DT, PHASE 1DU, PHASE 1DV, PHASE 1DW, PHASE 1DX, PHASE 1DY, PHASE 1DZ, PHASE 1EA, PHASE 1EB, PHASE 1EC, PHASE 1ED, PHASE 1EE, PHASE 1EF, PHASE 1EG, PHASE 1EH, PHASE 1EI, PHASE 1EJ, PHASE 1EK, PHASE 1EL, PHASE 1EM, PHASE 1EN, PHASE 1EO, PHASE 1EP, PHASE 1EQ, PHASE 1ER, PHASE 1ES, PHASE 1ET, PHASE 1EU, PHASE 1EV, PHASE 1EW, PHASE 1EX, PHASE 1EY, PHASE 1EZ, PHASE 1FA, PHASE 1FB, PHASE 1FC, PHASE 1FD, PHASE 1FE, PHASE 1FF, PHASE 1FG, PHASE 1FH, PHASE 1FI, PHASE 1FJ, PHASE 1FK, PHASE 1FL, PHASE 1FM, PHASE 1FN, PHASE 1FO, PHASE 1FP, PHASE 1FQ, PHASE 1FR, PHASE 1FS, PHASE 1FT, PHASE 1FU, PHASE 1FV, PHASE 1FW, PHASE 1FX, PHASE 1FY, PHASE 1FZ, PHASE 1GA, PHASE 1GB, PHASE 1GC, PHASE 1GD, PHASE 1GE, PHASE 1GF, PHASE 1GG, PHASE 1GH, PHASE 1GI, PHASE 1GJ, PHASE 1GK, PHASE 1GL, PHASE 1GM, PHASE 1GN, PHASE 1GO, PHASE 1GP, PHASE 1GQ, PHASE 1GR, PHASE 1GS, PHASE 1GT, PHASE 1GU, PHASE 1GV, PHASE 1GW, PHASE 1GX, PHASE 1GY, PHASE 1GZ, PHASE 1HA, PHASE 1HB, PHASE 1HC, PHASE 1HD, PHASE 1HE, PHASE 1HF, PHASE 1HG, PHASE 1HH, PHASE 1HI, PHASE 1HJ, PHASE 1HK, PHASE 1HL, PHASE 1HM, PHASE 1HN, PHASE 1HO, PHASE 1HP, PHASE 1HQ, PHASE 1HR, PHASE 1HS, PHASE 1HT, PHASE 1HU, PHASE 1HV, PHASE 1HW, PHASE 1HX, PHASE 1HY, PHASE 1HZ, PHASE 1IA, PHASE 1IB, PHASE 1IC, PHASE 1ID, PHASE 1IE, PHASE 1IF, PHASE 1IG, PHASE 1IH, PHASE 1II, PHASE 1IJ, PHASE 1IK, PHASE 1IL, PHASE 1IM, PHASE 1IN, PHASE 1IO, PHASE 1IP, PHASE 1IQ, PHASE 1IR, PHASE 1IS, PHASE 1IT, PHASE 1IU, PHASE 1IV, PHASE 1IW, PHASE 1IX, PHASE 1IY, PHASE 1IZ, PHASE 1JA, PHASE 1JB, PHASE 1JC, PHASE 1JD, PHASE 1JE, PHASE 1JF, PHASE 1JG, PHASE 1JH, PHASE 1JI, PHASE 1JJ, PHASE 1JK, PHASE 1JL, PHASE 1JM, PHASE 1JN, PHASE 1JO, PHASE 1JP, PHASE 1JQ, PHASE 1JR, PHASE 1JS, PHASE 1JT, PHASE 1JU, PHASE 1JV, PHASE 1JW, PHASE 1JX, PHASE 1JY, PHASE 1JZ, PHASE 1KA, PHASE 1KB, PHASE 1KC, PHASE 1KD, PHASE 1KE, PHASE 1KF, PHASE 1KG, PHASE 1KH, PHASE 1KI, PHASE 1KJ, PHASE 1KK, PHASE 1KL, PHASE 1KM, PHASE 1KN, PHASE 1KO, PHASE 1KP, PHASE 1KQ, PHASE 1KR, PHASE 1KS, PHASE 1KT, PHASE 1KU, PHASE 1KV, PHASE 1KW, PHASE 1KX, PHASE 1KY, PHASE 1KZ, PHASE 1LA, PHASE 1LB, PHASE 1LC, PHASE 1LD, PHASE 1LE, PHASE 1LF, PHASE 1LG, PHASE 1LH, PHASE 1LI, PHASE 1LJ, PHASE 1LK, PHASE 1LL, PHASE 1LM, PHASE 1LN, PHASE 1LO, PHASE 1LP, PHASE 1LQ, PHASE 1LR, PHASE 1LS, PHASE 1LT, PHASE 1LU, PHASE 1LV, PHASE 1LW, PHASE 1LX, PHASE 1LY, PHASE 1LZ, PHASE 1MA, PHASE 1MB, PHASE 1MC, PHASE 1MD, PHASE 1ME, PHASE 1MF, PHASE 1MG, PHASE 1MH, PHASE 1MI, PHASE 1MJ, PHASE 1MK, PHASE 1ML, PHASE 1MM, PHASE 1MN, PHASE 1MO, PHASE 1MP, PHASE 1MQ, PHASE 1MR, PHASE 1MS, PHASE 1MT, PHASE 1MU, PHASE 1MV, PHASE 1MW, PHASE 1MX, PHASE 1MY, PHASE 1MZ, PHASE 1NA, PHASE 1NB, PHASE 1NC, PHASE 1ND, PHASE 1NE, PHASE 1NF, PHASE 1NG, PHASE 1NH, PHASE 1NI, PHASE 1NJ, PHASE 1NK, PHASE 1NL, PHASE 1NM, PHASE 1NN, PHASE 1NO, PHASE 1NP, PHASE 1NQ, PHASE 1NR, PHASE 1NS, PHASE 1NT, PHASE 1NU, PHASE 1NV, PHASE 1NW, PHASE 1NX, PHASE 1NY, PHASE 1NZ, PHASE 1OA, PHASE 1OB, PHASE 1OC, PHASE 1OD, PHASE 1OE, PHASE 1OF, PHASE 1OG, PHASE 1OH, PHASE 1OI, PHASE 1OJ, PHASE 1OK, PHASE 1OL, PHASE 1OM, PHASE 1ON, PHASE 1OO, PHASE 1OP, PHASE 1OQ, PHASE 1OR, PHASE 1OS, PHASE 1OT, PHASE 1OU, PHASE 1OV, PHASE 1OW, PHASE 1OX, PHASE 1OY, PHASE 1OZ, PHASE 1PA, PHASE 1PB, PHASE 1PC, PHASE 1PD, PHASE 1PE, PHASE 1PF, PHASE 1PG, PHASE 1PH, PHASE 1PI, PHASE 1PJ, PHASE 1PK, PHASE 1PL, PHASE 1PM, PHASE 1PN, PHASE 1PO, PHASE 1PP, PHASE 1PQ, PHASE 1PR, PHASE 1PS, PHASE 1PT, PHASE 1PU, PHASE 1PV, PHASE 1PW, PHASE 1PX, PHASE 1PY, PHASE 1PZ, PHASE 1QA, PHASE 1QB, PHASE 1QC, PHASE 1QD, PHASE 1QE, PHASE 1QF, PHASE 1QG, PHASE 1QH, PHASE 1QI, PHASE 1QJ, PHASE 1QK, PHASE 1QL, PHASE 1QM, PHASE 1QN, PHASE 1QO, PHASE 1QP, PHASE 1QQ, PHASE 1QR, PHASE 1QS, PHASE 1QT, PHASE 1QU, PHASE 1QV, PHASE 1QW, PHASE 1QX, PHASE 1QY, PHASE 1QZ, PHASE 1RA, PHASE 1RB, PHASE 1RC, PHASE 1RD, PHASE 1RE, PHASE 1RF, PHASE 1RG, PHASE 1RH, PHASE 1RI, PHASE 1RJ, PHASE 1RK, PHASE 1RL, PHASE 1RM, PHASE 1RN, PHASE 1RO, PHASE 1RP, PHASE 1RQ, PHASE 1RR, PHASE 1RS, PHASE 1RT, PHASE 1RU, PHASE 1RV, PHASE 1RW, PHASE 1RX, PHASE 1RY, PHASE 1RZ, PHASE 1SA, PHASE 1SB, PHASE 1SC, PHASE 1SD, PHASE 1SE, PHASE 1SF, PHASE 1SG, PHASE 1SH, PHASE 1SI, PHASE 1SJ, PHASE 1SK, PHASE 1SL, PHASE 1SM, PHASE 1SN, PHASE 1SO, PHASE 1SP, PHASE 1SQ, PHASE 1SR, PHASE 1SS, PHASE 1ST, PHASE 1SU, PHASE 1SV, PHASE 1SW, PHASE 1SX, PHASE 1SY, PHASE 1SZ, PHASE 1TA, PHASE 1TB, PHASE 1TC, PHASE 1TD, PHASE 1TE, PHASE 1TF, PHASE 1TG, PHASE 1TH, PHASE 1TI, PHASE 1TJ, PHASE 1TK, PHASE 1TL, PHASE 1TM, PHASE 1TN, PHASE 1TO, PHASE 1TP, PHASE 1TQ, PHASE 1TR, PHASE 1TS, PHASE 1TT, PHASE 1TU, PHASE 1TV, PHASE 1TW, PHASE 1TX, PHASE 1TY, PHASE 1TZ, PHASE 1UA, PHASE 1UB, PHASE 1UC, PHASE 1UD, PHASE 1UE, PHASE 1UF, PHASE 1UG, PHASE 1UH, PHASE 1UI, PHASE 1UJ, PHASE 1UK, PHASE 1UL, PHASE 1UM, PHASE 1UN, PHASE 1UO, PHASE 1UP, PHASE 1UQ, PHASE 1UR, PHASE 1US, PHASE 1UT, PHASE 1UU, PHASE 1UV, PHASE 1UW, PHASE 1UX, PHASE 1UY, PHASE 1UZ, PHASE 1VA, PHASE 1VB, PHASE 1VC, PHASE 1VD, PHASE 1VE, PHASE 1VF, PHASE 1VG, PHASE 1VH, PHASE 1VI, PHASE 1VJ, PHASE 1VK, PHASE 1VL, PHASE 1VM, PHASE 1VN, PHASE 1VO, PHASE 1VP, PHASE 1VQ, PHASE 1VR, PHASE 1VS, PHASE 1VT, PHASE 1VU, PHASE 1VV, PHASE 1VW, PHASE 1VX, PHASE 1VY, PHASE 1VZ, PHASE 1WA, PHASE 1WB, PHASE 1WC, PHASE 1WD, PHASE 1WE, PHASE 1WF, PHASE 1WG, PHASE 1WH, PHASE 1WI, PHASE 1WJ, PHASE 1WK, PHASE 1WL, PHASE 1WM, PHASE 1WN, PHASE 1WO, PHASE 1WP, PHASE 1WQ, PHASE 1WR, PHASE 1WS, PHASE 1WT, PHASE 1WU, PHASE 1WV, PHASE 1WW, PHASE 1WX, PHASE 1WY, PHASE 1WZ, PHASE 1XA, PHASE 1XB, PHASE 1XC, PHASE 1XD, PHASE 1XE, PHASE 1XF, PHASE 1XG, PHASE 1XH, PHASE 1XI, PHASE 1XJ, PHASE 1XK, PHASE 1XL, PHASE 1XM, PHASE 1XN, PHASE 1XO, PHASE 1XP, PHASE 1XQ, PHASE 1XR, PHASE 1XS, PHASE 1XT, PHASE 1XU, PHASE 1XV, PHASE 1XW, PHASE 1XX, PHASE 1XY, PHASE 1XZ, PHASE 1YA, PHASE 1YB, PHASE 1YC, PHASE 1YD, PHASE 1YE, PHASE 1YF, PHASE 1YG, PHASE 1YH, PHASE 1YI, PHASE 1YJ, PHASE 1YK, PHASE 1YL, PHASE 1YM, PHASE 1YN, PHASE 1YO, PHASE 1YP, PHASE 1YQ, PHASE 1YR, PHASE 1YS, PHASE 1YT, PHASE 1YU, PHASE 1YV, PHASE 1YW, PHASE 1YX, PHASE 1YY, PHASE 1YZ, PHASE 1ZA, PHASE 1ZB, PHASE 1ZC, PHASE 1ZD, PHASE 1ZE, PHASE 1ZF, PHASE 1ZG, PHASE 1ZH, PHASE 1ZI, PHASE 1ZJ, PHASE 1ZK, PHASE 1ZL, PHASE 1ZM, PHASE 1ZN, PHASE 1ZO, PHASE 1ZP, PHASE 1ZQ, PHASE 1ZR, PHASE 1ZS, PHASE 1ZT, PHASE 1ZU, PHASE 1ZV, PHASE 1ZW, PHASE 1ZX, PHASE 1ZY, PHASE 1ZZ.

DEDICATION STATEMENT

BY THE RECORDING OF THIS PLAT, AND UPON APPROVAL AND ACCEPTANCE BY THE CITY OF CHARLESTON, I HEREBY DEDICATE ALL RIGHTS, RIGHTS-OF-WAY, AND EASEMENTS TO THE USE OF THE PUBLIC FOREVER.

OWNER OR REPRESENTATIVE DATE



1. JOHNATHAN F. BURNS, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF SOUTH CAROLINA, HEREBY STATE THAT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THE SURVEY HEREIN WAS MADE IN ACCORDANCE WITH THE REQUIREMENTS OF MINIMUM STANDARDS MANUAL FOR THE PRACTICE OF LAND SURVEYING IN SOUTH CAROLINA, AND MEETS OR EXCEEDS THE REQUIREMENTS FOR A CLASS A SURVEY AS SPECIFIED THEREIN. ALSO THERE ARE NO VISIBLE CHANGES OR MODIFICATIONS OTHER THAN SHOWN.

THIS SURVEY IS NOT VALID UNLESS EMBOSSED WITH AN ORIGINAL SURVEYOR'S SEAL. THIS SURVEY HAS BEEN DONE WITHOUT THE BENEFIT OF REVIEWING A CURRENT TITLE SEARCH.

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 28TH DAY OF SEPTEMBER, 2014.

JOHNATHAN F. BURNS, PLS-22743

NEIGHBORHOOD DISTRICT TABLE FOR PHASE 4

TRIC MASTERPLAN (30 APRIL 2015)	RECORDED PLATS (1A, 1B, 1C, 2A-2I, 2C, 2E, 2G)	PHASE 4
ACREAGE	ACRES	ACRES
NET GROSS	6.07	6.07
TOTAL UNITS	802	253
SINGLE FAMILY DETACHED	24.03	185
SINGLE FAMILY ATTACHED	20.79	240
MIXED USE	12	377
MIXED USE	2.9	0
OUTDOOR SPACE	ACRES	ACRES
SHARABLE OUTDOOR SPACE	5.74	2.1
PLAZA/SQUARE	0.84	0
SHARABLE OUTDOOR PARKS	3.83	0.46
GREENWAYS	6.66	4.99
SUBTOTAL	16.99	7.55
OUTDOOR SPACE TOTAL	ACRES	ACRES
SHARABLE OUTDOOR SPACE	17.57	7.55
CONSERVATION (SIDE W)	ACRES	ACRES
OUTDOOR SPACE TOTAL	34.31 (17.15)	12.8 (6.41)
SUBTOTAL	34.72	6.18
UNCLASSIFIED HOA	0.76	0.22

ONE MILE

1.1 3.257172 W 15.30	1.2 3.257172 W 15.30	1.3 3.257172 W 15.30	1.4 3.257172 W 15.30	1.5 3.257172 W 15.30	1.6 3.257172 W 15.30	1.7 3.257172 W 15.30	1.8 3.257172 W 15.30	1.9 3.257172 W 15.30	2.0 3.257172 W 15.30	2.1 3.257172 W 15.30	2.2 3.257172 W 15.30	2.3 3.257172 W 15.30	2.4 3.257172 W 15.30	2.5 3.257172 W 15.30	2.6 3.257172 W 15.30	2.7 3.257172 W 15.30	2.8 3.257172 W 15.30	2.9 3.257172 W 15.30	3.0 3.257172 W 15.30	3.1 3.257172 W 15.30	3.2 3.257172 W 15.30	3.3 3.257172 W 15.30	3.4 3.257172 W 15.30	3.5 3.257172 W 15.30	3.6 3.257172 W 15.30	3.7 3.257172 W 15.30	3.8 3.257172 W 15.30	3.9 3.257172 W 15.30	4.0 3.257172 W 15.30	4.1 3.257172 W 15.30	4.2 3.257172 W 15.30	4.3 3.257172 W 15.30	4.4 3.257172 W 15.30	4.5 3.257172 W 15.30	4.6 3.257172 W 15.30	4.7 3.257172 W 15.30	4.8 3.257172 W 15.30	4.9 3.257172 W 15.30	5.0 3.257172 W 15.30	5.1 3.257172 W 15.30	5.2 3.257172 W 15.30	5.3 3.257172 W 15.30	5.4 3.257172 W 15.30	5.5 3.257172 W 15.30	5.6 3.257172 W 15.30	5.7 3.257172 W 15.30	5.8 3.257172 W 15.30	5.9 3.257172 W 15.30	6.0 3.257172 W 15.30	6.1 3.257172 W 15.30	6.2 3.257172 W 15.30	6.3 3.257172 W 15.30	6.4 3.257172 W 15.30	6.5 3.257172 W 15.30	6.6 3.257172 W 15.30	6.7 3.257172 W 15.30	6.8 3.257172 W 15.30	6.9 3.257172 W 15.30	7.0 3.257172 W 15.30	7.1 3.257172 W 15.30	7.2 3.257172 W 15.30	7.3 3.257172 W 15.30	7.4 3.257172 W 15.30	7.5 3.257172 W 15.30	7.6 3.257172 W 15.30	7.7 3.257172 W 15.30	7.8 3.257172 W 15.30	7.9 3.257172 W 15.30	8.0 3.257172 W 15.30	8.1 3.257172 W 15.30	8.2 3.257172 W 15.30	8.3 3.257172 W 15.30	8.4 3.257172 W 15.30	8.5 3.257172 W 15.30	8.6 3.257172 W 15.30	8.7 3.257172 W 15.30	8.8 3.257172 W 15.30	8.9 3.257172 W 15.30	9.0 3.257172 W 15.30	9.1 3.257172 W 15.30	9.2 3.257172 W 15.30	9.3 3.257172 W 15.30	9.4 3.257172 W 15.30	9.5 3.257172 W 15.30	9.6 3.257172 W 15.30	9.7 3.257172 W 15.30	9.8 3.257172 W 15.30	9.9 3.257172 W 15.30	10.0 3.257172 W 15.30	10.1 3.257172 W 15.30	10.2 3.257172 W 15.30	10.3 3.257172 W 15.30	10.4 3.257172 W 15.30	10.5 3.257172 W 15.30	10.6 3.257172 W 15.30	10.7 3.257172 W 15.30	10.8 3.257172 W 15.30	10.9 3.257172 W 15.30	11.0 3.257172 W 15.30	11.1 3.257172 W 15.30	11.2 3.257172 W 15.30	11.3 3.257172 W 15.30	11.4 3.257172 W 15.30	11.5 3.257172 W 15.30	11.6 3.257172 W 15.30	11.7 3.257172 W 15.30	11.8 3.257172 W 15.30	11.9 3.257172 W 15.30	12.0 3.257172 W 15.30	12.1 3.257172 W 15.30	12.2 3.257172 W 15.30	12.3 3.257172 W 15.30	12.4 3.257172 W 15.30	12.5 3.257172 W 15.30	12.6 3.257172 W 15.30	12.7 3.257172 W 15.30	12.8 3.257172 W 15.30	12.9 3.257172 W 15.30	13.0 3.257172 W 15.30	13.1 3.257172 W 15.30	13.2 3.257172 W 15.30	13.3 3.257172 W 15.30	13.4 3.257172 W 15.30	13.5 3.257172 W 15.30	13.6 3.257172 W 15.30	13.7 3.257172 W 15.30	13.8 3.257172 W 15.30	13.9 3.257172 W 15.30	14.0 3.257172 W 15.30	14.1 3.257172 W 15.30	14.2 3.257172 W 15.30	14.3 3.257172 W 15.30	14.4 3.257172 W 15.30	14.5 3.257172 W 15.30	14.6 3.257172 W 15.30	14.7 3.257172 W 15.30	14.8 3.257172 W 15.30	14.9 3.257172 W 15.30	15.0 3.257172 W 15.30	15.1 3.257172 W 15.30	15.2 3.257172 W 15.30	15.3 3.257172 W 15.30	15.4 3.257172 W 15.30	15.5 3.257172 W 15.30	15.6 3.257172 W 15.30	15.7 3.257172 W 15.30	15.8 3.257172 W 15.30	15.9 3.257172 W 15.30	16.0 3.257172 W 15.30	16.1 3.257172 W 15.30	16.2 3.257172 W 15.30	16.3 3.257172 W 15.30	16.4 3.257172 W 15.30	16.5 3.257172 W 15.30	16.6 3.257172 W 15.30	16.7 3.257172 W 15.30	16.8 3.257172 W 15.30	16.9 3.257172 W 15.30	17.0 3.257172 W 15.30	17.1 3.257172 W 15.30	17.2 3.257172 W 15.30	17.3 3.257172 W 15.30	17.4 3.257172 W 15.30	17.5 3.257172 W 15.30	17.6 3.257172 W 15.30	17.7 3.257172 W 15.30	17.8 3.257172 W 15.30	17.9 3.257172 W 15.30	18.0 3.257172 W 15.30	18.1 3.257172 W 15.30	18.2 3.257172 W 15.30	18.3 3.257172 W 15.30	18.4 3.257172 W 15.30	18.5 3.257172 W 15.30	18.6 3.257172 W 15.30	18.7 3.257172 W 15.30	18.8 3.257172 W 15.30	18.9 3.257172 W 15.30	19.0 3.257172 W 15.30	19.1 3.257172 W 15.30	19.2 3.257172 W 15.30	19.3 3.257172 W 15.30	19.4 3.257172 W 15.30	19.5 3.257172 W 15.30	19.6 3.257172 W 15.30	19.7 3.257172 W 15.30	19.8 3.257172 W 15.30	19.9 3.257172 W 15.30	20.0 3.257172 W 15.30	20.1 3.257172 W 15.30	20.2 3.257172 W 15.30	20.3 3.257172 W 15.30	20.4 3.257172 W 15.30	20.5 3.257172 W 15.30	20.6 3.257172 W 15.30	20.7 3.25717
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STATE OF SOUTH CAROLINA)
)
)
)
COUNTY OF CHARLESTON)
)
)
)
CITY OF CHARLESTON

This Agreement is made and entered into this ____ day of September 2016, by and between the City of Charleston, a Municipal Corporation organized and existing pursuant to the laws of the State of South Carolina (herein the "City"), and Sabal Homes at Whitney Lake, LLC (herein the "Owner").

WHEREAS, THE CITY OF CHARLESTON, is desirous of maintaining storm water drainage ditches and appurtenances ("Storm Water System") across a portion of ____ property identified by and designated as Charleston ____ County tax map number 312-00-00-143 and to accomplish this objective, the City must obtain certain easements from the Owner permitting the maintenance of the Storm Water System through the referenced portion of ____ the Owner's property as hereinafter described; and

WHEREAS, the undersigned Owner of the property is desirous of cooperating with the City and is minded to grant unto it certain permanent and exclusive storm water drainage easements in and to the property necessary therefor.

NOW, THEREFORE, in consideration of the foregoing and the benefits to be derived by the drainage improvements to the property, the Owner has granted, bargained, sold, released and conveyed by these present and does grant, bargain, sell, release and convey unto the City of Charleston all of those certain New City of Charleston Drainage Easements (or D.E.) as such are identified on the above referenced portion of ____ property and which are more fully shown on that certain plat entitled;

"Subdivision & Property Line Abandonment Plat Showing the Subdivision of TMS No. 312-00-00-143 to Create Johnston Point at Whitney Lake Subdivision F.K.A. The Gardens at Whitney Lake Subdivision, Phase 4, Containing Lots 1 through 53, Road Right-of-Ways and HOA Areas Owned by Sabal Homes at Whitney Lake, LLC Located in the City of Charleston Charleston County, South Carolina"

Prepared and executed by Jonathan F. Burns, PLS dated July 12, 2016,
revised on N/A, and recorded on ____ in Plat
Book ____ at Page ____ in the RMC Office for Charleston, South Carolina (herein the "Plat").

A copy of said plat is attached heretofore as "Exhibit A" and incorporated herein.

SAID EXCLUSIVE STORM WATER DRAINAGE EASEMENTS having such size, shape, location, and butting and bounding as shown on said Plat, reference to which is hereby made for a more complete description.

The City shall at all times have the right of ingress and egress to the land affected by the said Exclusive and Permanent Storm Water Drainage Easements for purposes of periodic inspection, maintenance, repair and replacement of the Storm Water System. These Exclusive and Permanent Storm Water Drainage Easements shall be commercial in nature and shall run with the land.

The City has no obligation to repair, replace or to compensate the Owner for trees, plants, grass, shrubs or other elements damaged or destroyed within the confines of these Exclusive and Permanent Storm Water Drainage Easements during the conduct of its allowable activities as described above.

TO HAVE AND TO HOLD, all and singular, the said before mentioned unto the said CITY OF CHARLESTON, its successors and assigns, against Owner and its heirs and assigns, and all persons whomsoever lawfully claiming or to claim the same or any part thereof.

IN WITNESS WHEREOF, the parties have set the Hands and Seals the day and year above written.

WITNESSES:

CITY OF CHARLESTON

Witness #1

By: Laura Cabiness
Its: Public Service Director

Witness #2

STATE OF SOUTH CAROLINA)
COUNTY OF CHARLESTON)

ACKNOWLEDGEMENT

The foregoing instrument was acknowledged before me (the undersigned notary) by _____, the _____ of the City of Charleston, a Municipal Corporation organized and existing pursuant to the laws of the State of South Carolina, on _____.

Signature: _____

Print Name of Notary: _____

Notary Public for _____

My Commission Expires: _____

SEAL OF NOTARY

WITNESSES:

Julia Thew
Witness #1

Robert Elliott Locklair
Witness #2

OWNER:

H. Matthew Jones
Name: H. Matthew Jones

STATE OF SOUTH CAROLINA)
COUNTY OF CHARLESTON)

ACKNOWLEDGEMENT

The foregoing instrument was acknowledged before me (the undersigned notary) by H. Matthew Jones, the Managing Member of Sabal Homes @ Whitney Lake, a Limited Liability Company, on behalf of the Owner on 29 SEPT. '16.

Signature: Robert Elliott Locklair

Print Name of Notary: Robert Elliott Locklair

Notary Public for South Carolina

My Commission Expires: 25 January 2017

SEAL OF NOTARY



VICINITY MAP (NTS)

DEDICATION STATEMENT
BY THE RECORDING OF THIS PLAT, AND UPON APPROVAL AND ACCEPTANCE BY THE CITY COUNCIL OF CHARLESTON, I HEREBY DEDICATE ALL ROADS, RIGHTS-OF-WAYS, AND EASEMENTS TO THE USE OF THE PUBLIC FOREVER.

OWNER OR REPRESENTATIVE _____ DATE _____

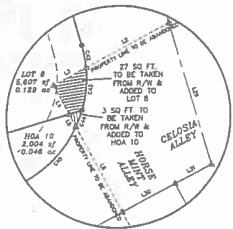
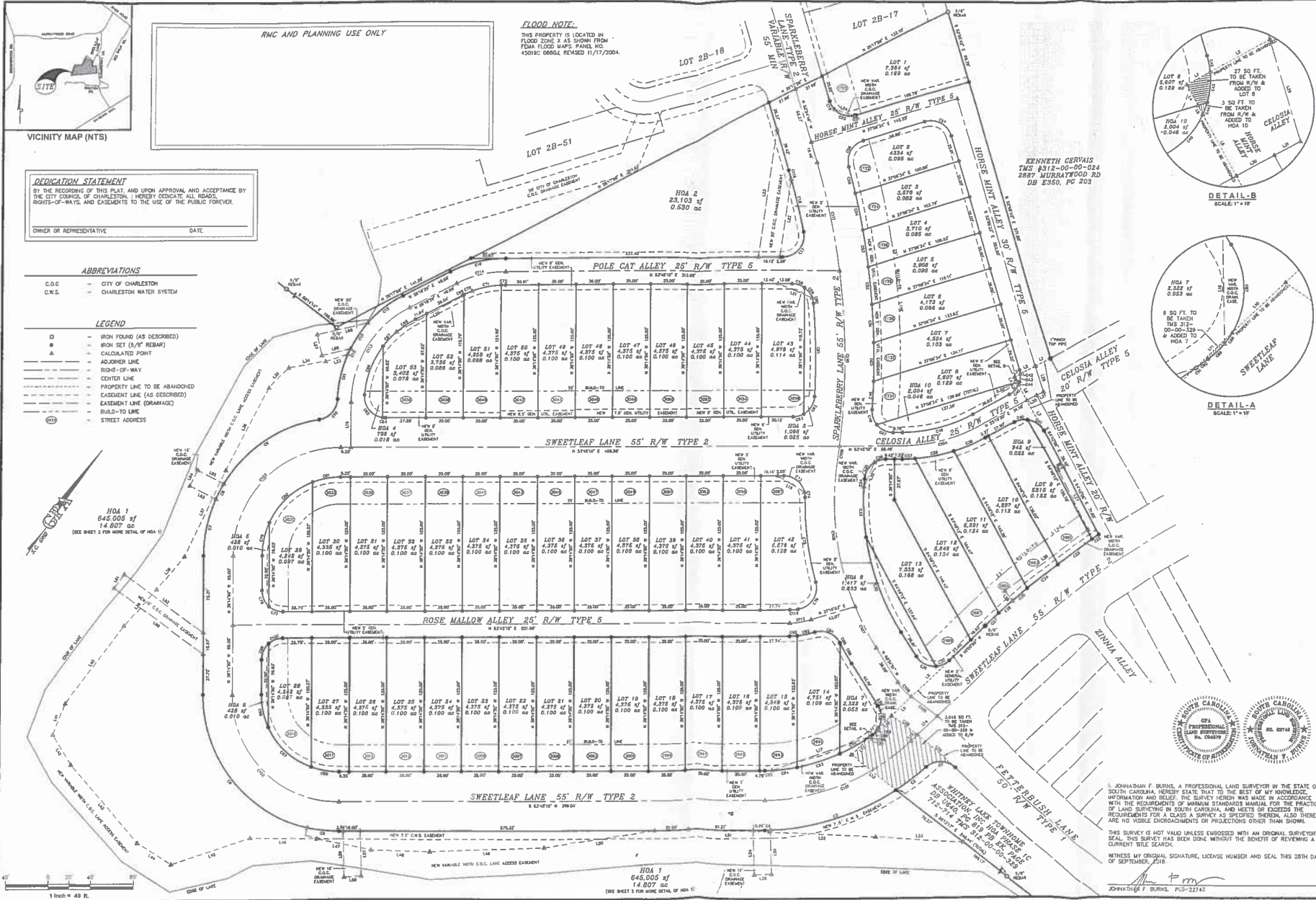
ABBREVIATIONS

- C.O.C. - CITY OF CHARLESTON
- C.W.S. - CHARLESTON WATER SYSTEM

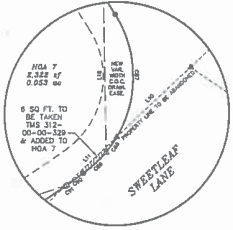
LEGEND

- - IRON PILING (AS DESCRIBED)
- - IRON SET (5/8" REBAR)
- - CALCULATED POINT
- - ADJACENT LINE
- - RIGHT-OF-WAY
- - CENTER LINE
- - PROPERTY LINE TO BE ABANDONED
- - EASEMENT LINE (AS DESCRIBED)
- - EASEMENT LINE (ORANGE)
- - BUILD-TO LINE
- - STREET ADDRESS

FLOOD NOTE:
THIS PROPERTY IS LOCATED IN FLOOD ZONE X AS SHOWN FROM FEMA FLOOD MAPS, PANEL NO. 45010C, 0800L, REVISED 11/17/2004.



DETAIL A
SCALE: 1" = 10'



DETAIL B
SCALE: 1" = 10'



237 OLD SUMMERVILLE RD
UNIT 1
SUMMERVILLE SC 29483
OFFICE (843) 283-3434
GPA OF CHARLOTTE, INC.
805 PINEHURST DR
CHARLOTTE NC 28218-3516
OFFICE (704) 315-8800
GPA OF BALDWIN, INC.
111 WEDGE AVENUE
BALDWIN NC 27603
CHARLESTON, SC 29423
OFFICE (843) 571-5091
FAX (843) 571-5992
"Integrity Without Boundaries"
www.gpaonline.com

SCALE 1" = 60'
PLS. BK. PG.
JOB NO. 165208
DATE 07/12/2016
DRAWN BY RCH
CHECKED BY DGC

SHOWING THE SUBDIVISION OF THE NO. 316-500-00-443 TO CREATE THE GARDENS AT WHITNEY LANE SUBDIVISION, PHASE 4, CONTAINING LOTS 1 THROUGH 53, ROAD RIGHT-OF-WAYS AND HOA AREAS OWNED BY GARDENS AT WHITNEY LANE, LLC LOCATED IN THE CITY OF CHARLESTON, CHARLESTON COUNTY, SOUTH CAROLINA.



JONATHAN F. BURNS, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF SOUTH CAROLINA, HEREBY STATE THAT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THE SURVEY HEREIN WAS MADE IN ACCORDANCE WITH THE REQUIREMENTS OF MINIMUM STANDARDS MANUAL FOR THE PRACTICE OF LAND SURVEYING IN SOUTH CAROLINA, AND MEETS OR EXCEEDS THE REQUIREMENTS FOR A CLASS A SURVEY AS SPECIFIED THEREIN, ALSO THERE ARE NO VISIBLE ENCROACHMENTS OR PROJECTIONS OTHER THAN SHOWN.
THIS SURVEY IS NOT VALID UNLESS EMBOSSED WITH AN ORIGINAL SURVEYOR'S SEAL. THIS SURVEY HAS BEEN DONE WITHOUT THE BENEFIT OF REVIEWING A CURRENT TITLE SEARCH.
WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 28TH DAY OF SEPTEMBER, 2016.
JONATHAN F. BURNS, PLS-22141

EXHIBIT A
SHEET 1 OF 2



RMC AND PLANNING USE ONLY

ACREAGE CHART

TOTAL AREA	24,630 ACRES
TOTAL R/W AREA	3,842 ACRES
TOTAL LOT AREA	3,534 ACRES
TOTAL HOA AREA	13,534 ACRES

- REFERENCES:
1. A SUBDIVISION PLAT OF TRACT B, TO CREATE PHASE 2 WHITNEY LAKE, CONTAINING 5,311 ACRES, BY SOUTHEASTERN SURVEYING OF CHARLOTTE, INC., DATED JULY 14, 2004, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 2. A SUBDIVISION PLAT AND BOUNDARY LINE ADJUSTMENT PLAT OF TRACTS B AND NO. 40 INTO PHASE 1A, PHASE 1B AND RESIDUAL TRACT B, BY SOUTHEASTERN SURVEYING OF CHARLOTTE, INC., DATED JULY 14, 2004, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 3. A BOUNDARY LINE ADJUSTMENT OF EXISTING PHASE 1B, OWNED BY THE LPI COMPANY AND A PORTION OF TRACT B, OWNED BY FRASER REAL PROPERTY, L.P., BY SOUTHEASTERN SURVEYING OF CHARLOTTE, INC., DATED JULY 14, 2004, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 4. FINAL SUBDIVISION PLAT OF PHASE 1B, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 5. FINAL SUBDIVISION PLAT OF PHASE 1C, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 6. FINAL SUBDIVISION PLAT OF PHASE 1D, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 7. FINAL SUBDIVISION PLAT OF PHASE 1E, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 8. FINAL SUBDIVISION PLAT OF PHASE 1F, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 9. FINAL SUBDIVISION PLAT OF PHASE 1G, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.
 10. FINAL SUBDIVISION PLAT OF PHASE 1H, OWNED BY THOMAS & HUTTON, REVISION DATE MAY 25, 2012, AND RECORDED IN THE CHARLOTTE COUNTY P.L.C. IN PLAT BOOK 40, PAGE 48.

DEVELOPER INFORMATION:
SABAL HOMES @ WHITNEY LAKE, LLC
c/o MATT JONES
421 WANDO PARK LANE, SUITE 230
MOUNT PLEASANT, SC 29464
m.jones@sabalahomes.net
843-388-8453

FLOOD NOTE:
THIS PROPERTY IS LOCATED IN
FLOOD ZONE X AS SHOWN FROM
FEMA FLOOD MAPS, PANEL NO.
40062, DATED 11/17/2004.

- NOTES:
1. AREA WAS DETERMINED BY THE COORDINATE METHOD.
 2. ANYTHING SHOWN OUTSIDE THE DEFINED BOUNDARY IS FOR DESCRIPTIVE PURPOSES ONLY.
 3. THE PUBLIC RECORD REFERENCE TO THIS PLAT ARE ONLY USED FOR NECESSARY TO THE ESTABLISHMENT OF THE BOUNDARY OF THIS PROPERTY. THEY ARE NOT AND DO NOT CONSTITUTE A TITLE SEARCH.
 4. DISTANCE SHOWN HEREIN ARE HORIZONTAL GROUND DISTANCES.
 5. NO SURVEYOR OR ENVIRONMENTAL INVESTIGATION OR SURVEYING WAS PERFORMED FOR THIS PLAT. THEREFORE THIS PLAT DOES NOT REFLECT THE EXISTENCE OR NON-EXISTENCE OF MINES, CONTAMINATION OR OTHER CONDITIONS WHICH MAY AFFECT THIS PROPERTY.
 6. THERE ARE NO APPLICABLE CRITICAL LINE BUFFERS OR SETBACKS ON THIS PROPERTY.
 7. NO LAND OR OTHER AREA IS DEDICATED FOR PUBLIC USE BY THIS PLAT UNLESS A DEDICATION IS EXPRESSLY STATED HEREIN.
 8. TOTAL NUMBER OF LOTS IS 43 SINGLE FAMILY LOTS. THE LARGEST LOT IS LOT 1 - 7,364.51 SF - 0.168 AC. THE SMALLEST LOT IS LOT 33 - 3,402.37 SF - 0.078 AC.
 9. CURRENT ZONING IS NEIGHBORHOOD DISTRICT OVERLAY (NO-H). ALL RESIDENTIAL LOTS SHOWN IN PHASE 4 ARE SINGLE FAMILY DETACHED. CITY PROJECT ID: 1010077-SHEET/PLAN-1. FRONT BUILD TO ZONE: 0-25' (TYPE 2 STREET) 0-5' (TYPE 3 STREET).
 10. PUBLIC WATER PROVIDED BY ST. JOHN'S WATER DISTRICT. EXTENDED FROM EXISTING WATER FACILITIES IN PHASES 1C AND 2B. PUBLIC SEWER PROVIDED BY ST. JOHN'S WATER DISTRICT. EXTENDED FROM EXISTING SEWER FACILITIES IN PHASES 1C AND 2B.
 11. OWNERSHIP AND MAINTENANCE RESPONSIBILITIES OF ALL HOA OPEN SPACES, COMMON AREAS, AND GREENWAYS, ARE THAT OF THE WHITNEY LAKE HOMEOWNERS ASSOCIATION IN ADDITION TO OUTDOOR SPACE, PLAZAS/PARKS, NEIGHBORHOOD GREENS AND PARKS, AND CONSIDERATION AREAS.
 12. ALL OUTDOOR SPACE IMPROVEMENTS MUST BE MADE PRIOR TO ACCEPTANCE OF FINAL PLAT. THE CITY OF CHARLOTTE SHALL HAVE NO RESPONSIBILITY FOR MAINTENANCE, REPAIR OR REPLACEMENT OF ANY DEVELOPMENT IMPROVEMENTS OVER AND/OR ACROSS THE DRAINAGE IMPROVEMENTS WITHIN THE EASEMENT, SUCH AS: PARKING, PAVING, LANDSCAPING, SIGNS, FENCES, ETC.
 13. ALL STREETS WILL BE PUBLIC.
 14. THE CITY OF CHARLOTTE DRAINAGE EASEMENTS SHOWN ARE DEDICATED TO THE CITY OF CHARLOTTE FOR ACCESS TO AND MAINTENANCE OF THE STORMWATER SYSTEM.
 15. THE LAND ACROSS EASEMENT SHOWN IS DEDICATED TO THE CITY OF CHARLOTTE FOR ACCESS TO THE STORMWATER MANAGEMENT FACILITY. THE LONG-TERM MAINTENANCE AND OPERATION OF THE STORMWATER MANAGEMENT FACILITY IS THE RESPONSIBILITY OF THE OWNERS OF THE PARCELS OR TO THE PROPERTY OWNERS ASSOCIATION (POA) OF HOMEOWNERS ASSOCIATION (HOA) AND SHALL BE COMPLETED IN ACCORDANCE WITH THE COVENANTS FOR PERMANENT MAINTENANCE OF STORMWATER FACILITIES COMPLETED FOR THIS SUBDIVISION.

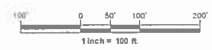
DEDICATION STATEMENT
BY THE RECORDING OF THIS PLAT, AND UPON APPROVAL AND ACCEPTANCE BY THE CITY COUNCIL OF CHARLOTTE, I HEREBY DEDICATE ALL RIGHTS, RIGHTS-OF-WAY, AND EASEMENTS TO THE USE OF THE PUBLIC FOREVER.

OWNER OR REPRESENTATIVE: _____ DATE: _____

I, JONATHAN F. BURNS, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF SOUTH CAROLINA, HEREBY STATE THAT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THE SURVEY HEREIN WAS MADE IN ACCORDANCE WITH THE REQUIREMENTS OF UNIFORM STANDARDS MANUAL FOR THE PRACTICE OF LAND SURVEYING IN SOUTH CAROLINA, AND NO VIOLATION OF THE REQUIREMENTS FOR A CLASS A SURVEY AS SPECIFIED THEREIN, ALSO THERE ARE NO USABLE DISCREPANCIES OR PROBLEMS OTHER THAN SHOWN.

THIS SURVEY IS NOT VALID UNLESS ENDORSED WITH AN ORIGINAL SURVEYOR'S SEAL. THIS SURVEY HAS BEEN DONE WITHOUT THE BENEFIT OF REVIEWING A CURRENT TITLE SEARCH.

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 28TH DAY OF SEPTEMBER, 2016.



NEIGHBORHOOD DISTRICT TABLE FOR PHASE 4

TRC MASTERPLAN (20 APRIL 2015)		RECORDED PLATS (1A, 1B, 1C, 2A, 2B, 2C, 2D)		PHASE 4	
ACREAGE	ACRES	ACREAGE	ACRES	ACREAGE	ACRES
GROSS LAND	155	78.65	24.630		
RESIDUAL TRACTS	51	1.99			
MANMADE LAKE (DOS)	12.65	6.73	12.82		
NET ACREAGE (UPLAND)	137.33	86.93	11.81		
UNITS/CONV					
NET DENSITY	-	8.07			
TOTAL UNITS	-	802	-	255	-
SINGLE FAMILY DETACHED	24.03	183	14.48	122	5.53
SINGLE FAMILY ATTACHED	20.78	240	8.37	236	0
MULTIFAMILY	12	377	0	0	0
MIXED USE	2.5	0	0	0	0
OUTDOOR SPACE & HOA					
NEIGHBORHOOD GREEN	3.74	2.1	0.53		
PLAZA/SQUARE	0.84	0	0		
NEIGHBORHOOD PARKS	3.83	0.48	0		
GREENWAYS	5.08	4.99	1.99		
SUBTOTAL	18.59	7.55	2.52		
OUTDOOR SPACE TOTAL					
USABLE OUTDOOR SPACE	17.57	7.55	1.99		
CONSERVATION (USE IN)					
OUTDOOR SPACE TOTAL	34.31 (17.15)	1.28 (0.63)	12.82 (6.41)		
SUBTOTAL	34.73	0.16	5.4		
UNCLASSIFIED HOA	-	0.78	0.22		

Table with 10 columns: LINE, BEARING, DISTANCE, and 8 columns of coordinates (Easting, Northing, Easting, Northing, Easting, Northing, Easting, Northing). The table lists survey points and boundary descriptions for the property.

GDA
PROFESSIONAL LAND SURVEYOR
EST. 1987
317 OLD SUMMERVILLE RD
SUMMERVILLE, SC 29483
OFFICE (843) 571-9909
FAX (843) 571-9992

CDP OF RALPH, INC.
313 WARD AVENUE
RALPH, NC 27603

CHARLOTTE, SC 29412
OFFICE (843) 571-9909
FAX (843) 571-9992

"Integrity Without Boundaries"
- Jim Goodland -

SCALE: 1"=100'

F.L.D. BC. PG.

JOB NO. 150508

DATE: 07/12/2016

DRAWN BY: HGM

CHECKED BY: DLS

SHOWING THE SUBDIVISION OF THIS NO. 312-00-00-10 TO CREATE THE CARROLLTON PORT AT WHITNEY LAKE SUBDIVISION P.L.C. THE CARROLLTON PORT AT WHITNEY LAKE SUBDIVISION P.L.C. LOTS 1 THROUGH 54, ROAD RIGHT-OF-WAY AND HOA AREAS OWNED BY SABAL HOMES @ WHITNEY LAKE, LLC (SUBDIVISION OF THIS NO. 312-00-00-10 TO CREATE THE CARROLLTON PORT AT WHITNEY LAKE SUBDIVISION P.L.C. LOTS 1 THROUGH 54, ROAD RIGHT-OF-WAY AND HOA AREAS OWNED BY SABAL HOMES @ WHITNEY LAKE, LLC CHARLOTTE COUNTY, SOUTH CAROLINA.

SUBDIVISION & PROPERTY LINE ABANDONMENT PLAT

PREPARED FOR: SOUTHEASTERN SURVEYING, LLC

EXHIBIT A

SHEET 2 OF 2

CITY OF CHARLESTON

REDEVELOPMENT STANDARDS FOR STORMWATER



AECOM | 24 January 2017 | FINAL
EXECUTIVE REPORT

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TERMS AND ACRONYMS

BMPs	Best Management Practices; structural controls or behaviors which are used to manage stormwater
CGP	Construction General Permit; NPDES permit issued by SCDHEC governing construction sites larger than one-half acre
Channel Protection	Standards intended to prevent erosion and damage to natural stream channels from stormwater discharges and pipes
Coastal Zone	Coastal lands and waters with critical areas designated by SCDHEC
CWA	Clean Water Act
Design Storm	A particular storm size (intensity and frequency) used to design a site's stormwater control structures
Detention	Temporarily capturing stormwater runoff, in order to release it a slower rate
DS	Design Standards
EPA	US Environmental Protection Agency; establishes clean water standards
FEMA	Federal Emergency Management Agency; establishes floodplain standards
Filtration	Straining runoff through a mesh or sand/gravel media in order to remove pollutants
Flood Control	Standards intended to address large storms and prevent damage to downstream property and infrastructure
Flowrate	Combination of rate and volume; typically expressed as cubic feet per second
Impaired Waters	Water bodies which do not meet SC standards for their designated uses
Impervious Areas	Hard surfaces, such as roofs, pavement, and compacted soil, which prevent rainfall from soaking into the ground.
Infiltration	The process of water soaking into the underlying soil and groundwater
LID	Low Impact Development
Modern Stormwater Management	Addresses both water quantity and water quality; attempts to mimic and restore natural flow paths and treatment processes
MS4	Municipal Separate Storm Sewer System; NPDES permit issued by SCDEHC governing stormwater management within a municipal area
New Development	Construction, installation, or alteration of land, a structure, impervious surface or drainage facility; soil disturbance; or any division or subdivision of a lot, tract, parcel, or other divisions by plat or deed (Ch 27 City Code also uses this definition for Redevelopment)
NPDES	National Pollutant Discharge Elimination System; federal permit program for stormwater and wastewater, administered by SCDHEC
Pollutants	Any substance or material not naturally present in water, or a natural substance which is present in excessive quantities, such as sediment



Pre-development	The condition of the land at some time previous to a proposed new action (general); conditions which exist prior to the time the applicant commences any construction, development or re-development activity (DS definition)
Rainfall Frequency	How often a rain event of a given size occurs; typically expressed as “10-year storm”, “25-year storm”, etc
Rainfall Intensity	Amount of rainfall in a given time period; typically expressed as inches per hour
Rate	Speed of runoff; typically expressed as feet per second
Redevelopment	Construction, installation or land disturbance on a previously disturbed site (general); land disturbance that alters current use of land but does not necessarily alter pre-dev runoff characteristics (SC Reg 72-300)
Retention	Capturing runoff and storing on-site for infiltration, evaporation or reuse
Riparian Buffer	Vegetated area along stream channels which protects the stream from damage, filters runoff and maintains ecological function
Runoff	Water generated when rainfall travels over land rather than soaking in
Runoff Reduction	Reduce or eliminate runoff volume via infiltration, evaporation or reuse
SCDHEC	South Carolina Department of Health and Environmental Control
Special Stormwater Management Areas	Areas which require additional control of stormwater quality and quantity than that provided by minimum design standards
Suburban	Medium density developed areas
SWDSM	City of Charleston Stormwater Design Standards Manual
SWMP	Stormwater Management Plan; City of Charleston’s implementation plan to comply with MS4 Permit requirements
Traditional Stormwater Management	Addresses primarily water quantity and focuses on impacts from flooding; may not address water quality or other community interests
TMDL	Total Maximum Daily Load; state regulatory process to improve water quality of impaired waters
Urban	High density developed areas
Volume	Amount of runoff; typically expressed in cubic feet or acre-feet
Water Quality	Chemical and biological characteristics of runoff
Water Quantity	Amount (volume) and speed (rate) characteristics of runoff
Watershed	Land area draining to a common point
Wetlands	Partially submerged areas at the edge of land



EXECUTIVE SUMMARY

Objective

Provide an overview of stormwater and redevelopment issues and present options for stormwater redevelopment standards for the City of Charleston (City).

Key Points

- The current City stormwater design standards do not distinguish between new development and redevelopment. Redevelopment design standards are currently the same as standards for new development, producing very little drainage improvement when redevelopment occurs in built-out areas.
- Redevelopment provides a rare opportunity to improve stormwater management in existing urban and suburban areas.
- Updating the City's stormwater design standards for redevelopment sites can and should align with the City's current zoning standards for redevelopment sites. Zoning standards currently address buffers and setbacks, trees and landscaping, lane width, parking areas, permeable paving, low impact development, and other topics which intersect with stormwater requirements.
- Redevelopment standards would allow for incremental improvement of stormwater management in previously developed areas as sites are redeveloped. This helps to address community concerns about growth and development, and associated flooding and water quality.
- Modern stormwater management can improve aesthetics on a site, which is valued in the community. Improved stormwater management can also increase property value.
- South Carolina stormwater requirements are not as stringent or as proactive as stormwater standards in nearby states. The City has the opportunity to lead the metro area in implementing modern stormwater management.
- The timing is right to address redevelopment in the City. Redevelopment standards can be adopted as part of the overall update to the Stormwater Design Standards Manual, planned for 2017.

Concepts

In a natural condition, the land absorbs the majority of rainfall by infiltration. As the land is developed and becomes more urbanized, more of the land is covered by impervious surfaces, such as rooftops, pavement and compacted soil. An increasing amount of impervious surface results in less rainfall being infiltrated into the soil, and more running off. Impervious surfaces generate a larger volume of water and the runoff travels at a faster rate. Fast-moving, large



volumes of water cause erosion and flooding, and as the runoff travels, it picks up and transports pollutants.

Traditional stormwater management was primarily focused on water quantity, and drainage systems were designed for temporary detention and controlled release of floodwater. Modern stormwater management addresses flooding as well as pollution, and is focused on both water quantity and water quality. Modern drainage systems are designed for retention, and Best Management Practices (BMPs) are structures or devices which slow the rate of runoff, reduce or eliminate excess volume, and provide treatment to remove or reduce pollutants. Low Impact Development (LID) BMPs are designed to mimic natural flow patterns, infiltration and treatment processes. Some BMPs provide basic filtration and capture sediment/debris.

The City of Charleston has adopted a stormwater and floodplain Ordinance (Chapter 27 of the City Code), established stormwater Design Standards, and developed a Charleston-specific Municipal Stormwater Management Plan. Collectively, these address the design, construction and management of stormwater BMPs and the collection and conveyance system within the City of Charleston, and include requirements for redevelopment.

Redevelopment in Charleston

Analysis of the City's existing stormwater management standards and discussions with City staff regarding growth and redevelopment have identified a number of issues, listed below:

- Existing City stormwater design standards do not differentiate between new development and redevelopment.
- Existing City water quantity standards are primarily flowrate-based, temporary detention standards.
- Pre-development site condition and timeframe are not clearly defined.
- Unclear terminology in standards creates confusion, loopholes, unintended outcomes.
- Existing site conditions make quantity controls difficult, infeasible, or undesirable for some sites.
- Existing City standards specify temporary "store and release" of a "water quality volume".
- Existing City standards specify "retention" for projects in the Coastal Zone only.
- Existing City and State water quality standards are vague and at times, inconsistent.



Pre-development Considerations and Options

- Pre-development may be defined in a variety of ways, depending upon the relative amount and timing of land disturbance. The pre-development condition in turn impacts the redevelopment requirements.
- Pre-development may be defined as “pre-project” (the soil, vegetation and impervious conditions present immediately prior to submission of a project to the City).
- Pre-development may be defined as “pre-Columbian” (the native vegetation and soil conditions prior to the arrival of settlers in North America).
- Pre-development may be defined for a certain timeframe (number of years) prior to submission of a project to the City (thus allowing flexibility to the applicant for site status changes).
- Pre-development may also be defined according to a certain threshold of acreage, or of overall development, such that prior development greater than, for example, 20% of a site, triggers redevelopment requirements, but prior development less than 20% of a site would instead trigger new development requirements.
- Sites with prior development often have altered soil types and compaction, and potential contamination, therefore soil borings and testing are needed in order to determine existing site conditions.
- Pre-development should be clearly defined in the design standards and aligned with desired zoning densities and style of development in a particular area. Different pre-development definitions could be used for redevelopment quantity and quality criteria.

Redevelopment Considerations and Options

New development and redevelopment design standards are typically tiered or cascaded with overarching site considerations addressed first. Then for redevelopment sites, the most effective standards can be established for sites with ideal conditions, followed by more flexible standards for sites with difficult site conditions, or where the City desires to encourage redevelopment.

Design standards should be structured to account for the following types of requirements:

- Natural resources (wetlands, riparian buffers, wildlife habitat)
- Impaired waters
- Flood control and channel protection (peak flow rates and velocities)
- Runoff reduction (volume)
- Water quality (treatment)

Design standards which encourage runoff reduction (volume) via on-site retention, infiltration and LID are suitable for sites with ideal conditions. Ideal site conditions include the following:

- Clean soils with good infiltration
- Deeper water table



- Lower density suburban areas
- Sufficient space on-site
- Few site constraints

Design standards with flexible requirements are appropriate for sites with more difficult conditions and where runoff reduction and infiltration are infeasible. Difficult site conditions include the following:

- Small sites
- High density urban areas
- Desire to maintain character of streetscape
- Poor or contaminated soils
- Geotechnical hazards
- Shallow water table
- Complex existing infrastructure or other constraints

There are a number of options for redevelopment standards in the City of Charleston. Options may include:

- Adding a requirement for runoff reduction (volume)
- Selecting a more stringent design storm (in order to require a larger amount of stormwater to be managed)
- Capping the allowable percentage of impervious surface or requiring a certain amount of green space on a site (in order to reduce generation of runoff and to align with current zoning requirements)
- Adding a requirement for channel protection
- Considering the use of impact fees, in lieu of fees, or off-site mitigation or other credits

Preliminary Recommendations

Successful standards should define the terms new development, redevelopment and pre-development, as well as detention and retention. They should establish a minimum disturbance footprint and state whether the requirements apply to the entire site, disturbed area or impervious areas. A timeframe should be established for when the new standards will apply. Standards should also establish a threshold for switching from a runoff reduction (infiltration) requirement to a water quality treatment (filtration) requirement, or to allow an in lieu of or offset fee or mitigation. Successful standards should be flexible enough to encourage responsible redevelopment while discouraging new impervious surfaces.

Design standards should establish a tiered system for acceptable BMPs. Use of infiltration BMPs in site design is dependent on site soil characteristics, therefore implementation of infiltration BMPs should be on a site-specific basis with feasibility criteria. Site investigation and soil testing should be required in order to determine the appropriate tier. For acceptable soils, infiltration can be allowed. If site soils are too compacted or contaminated, or if site activities are likely to produce spills or contamination in the future, design standards should require filtration BMPs with a liner and prohibit any discharge to the groundwater or subsurface.



Design standards should establish prioritization for urban and suburban BMPs. LID BMPs are more easily implemented in suburban and new development areas. High density urban and redevelopment areas require more space-efficient BMPs that make use of existing hardscape (rooftops, sidewalks, plazas, etc). A prioritization ranking system should be established for allowable BMPs in the more urbanized areas, and in suburban areas, separately.

Topics Covered in this Document

Section 1 provides an introduction to stormwater and watersheds, with explanation of key terms and acronyms, and graphics. The introduction includes Stormwater 101 concepts, explanation of stormwater management techniques and BMPs, water quantity and quality controls, and legal drivers and implementation in South Carolina.

Section 2 is an analysis of stormwater and redevelopment issues in the City.

Section 3 summarizes options for stormwater redevelopment, and provides a comparison of redevelopment standards in other municipalities in coastal South Carolina, as well as in municipalities and states in the Southeast region.

Section 4 lays out the City's current stormwater standards in detail.

Section 5 lays out the State of South Carolina's current stormwater standards in detail.

Section 6 contains reference citations for the sources and graphics used in this report.



SECTION 1 - INTRODUCTION TO STORMWATER

Stormwater 101

During a storm, rainfall can either be intercepted by plants and trees, or fall on the land. In a natural condition, the land is able to absorb the majority of rainfall by a process called **infiltration**. As the land is developed and becomes more **urbanized**, more of the surface of the land is covered by **impervious surfaces**, such as rooftops, pavement and compacted soil. As shown in Figure 1, an increasing percentage of impervious surface results in less rainfall being infiltrated into the soil, and more of the rainfall running off. These hard surfaces generate a larger **volume** of water, and without the natural obstacles which would otherwise slow the water down, the runoff travels at a faster **rate**. Fast-moving, large volumes of water cause erosion and flooding, and can damage land and property downstream. Additionally, as the **runoff** travels over the land, it picks up pollutants. **Pollutants** are any substance or material not naturally present in rainwater or surface water, or a natural substance which is present in excessive quantities (such as sediment). **Impaired waters** cannot be used as intended, for recreation, water supply, fishing or shellfishing, etc. due to pollution, or may lose their ability to support aquatic life.

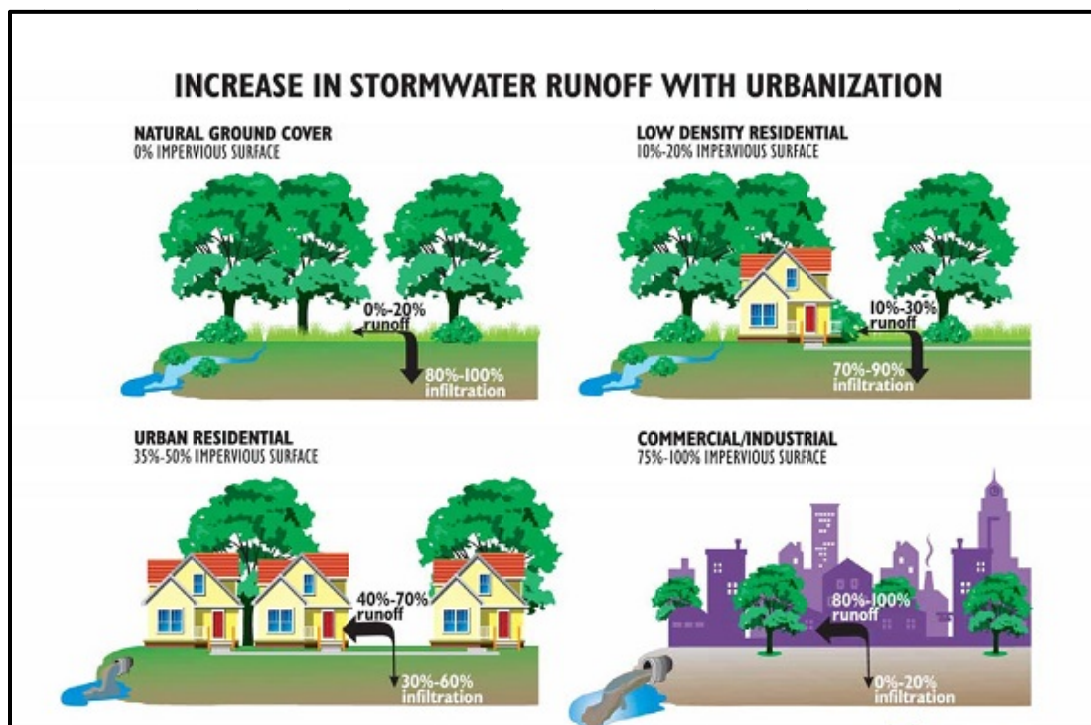


Figure 1: Diagram depicting changes in runoff and infiltration with increasing amounts of impervious surface

A **watershed** is an area of land which all drains to a single point, bounded by higher elevations at the edges. Within a watershed, water travels over land until it reaches a stream, and as the



water passes further downstream, draining a larger area, pollutants can accumulate. Ultimately, the rivers and streams reach the ocean, and any accumulated pollutants are discharged into the ocean. In the Lowcountry, **wetlands** fringe the edge of the land, and many of the local streams and creeks enter wetlands before discharging to the ocean. Wetlands perform a crucial function in the watershed, intercepting pollutants carried downstream and removing them from the water in a natural treatment process. Additionally, the wetlands slow the water down, allowing some of the runoff to infiltrate or be stored in the wetlands and slowly released long after the storm has passed. Figure 2 depicts how wetlands work.

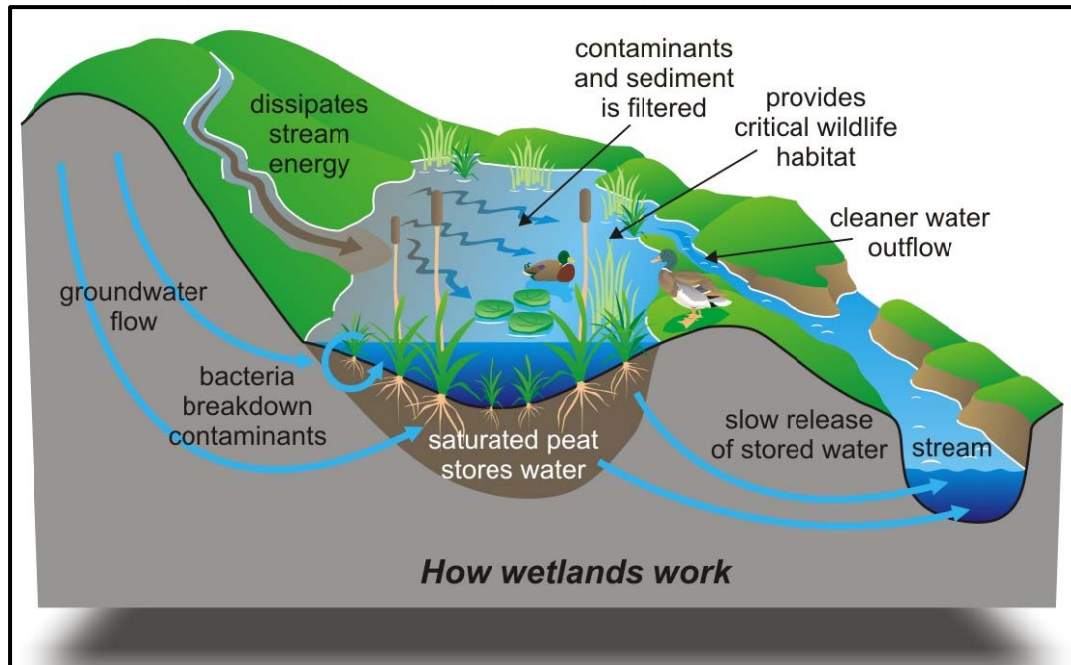


Figure 2: Diagram depicting role of wetlands in a watershed

Stormwater Management

Traditional stormwater management was primarily focused on **water quantity**. Drainage systems were designed to capture the large volume, high-rate runoff, reducing the peak flowrate if possible, and then convey the runoff rapidly away from developed areas. This is why in older areas of most cities, the stormwater system consists primarily of catch basin drains and stormwater pipes to collect and convey floodwaters, and also often includes some type of **detention** basin or pond to temporarily detain and control the runoff, before releasing the water at a controlled rate. These traditional systems often do not adequately address water quality, environmental, aesthetic or other community issues.

Modern stormwater management addresses flooding as well as pollution found in runoff, and therefore is focused on both **water quantity** and **water quality**. Modern stormwater management attempts to restore the natural function and connection of the streams in the watershed, and **Best Management Practices (BMP)** are used to slow the rate of runoff, reduce or eliminate the excess volume of runoff, and provide treatment to remove or reduce the



pollutants. BMPs are typically structures or devices which capture and treat runoff. Some BMPs provide flow-through treatment only, filtration of the runoff or physical removal of trash and debris entering the BMP, with cleaner water flowing out. Some BMPs provide on-site **retention** of runoff, allowing the retained water to infiltrate into the ground, evaporate into the atmosphere, or be reused for landscape irrigation or other purposes. Note that BMPs may also be behaviors which can improve stormwater quality, such as picking up after a pet. **Low Impact Development (LID)** BMPs are designed to mimic natural flow patterns across the land, as well as natural treatment processes. Figure 3 is a diagram of an LID BMP designed for infiltration of the runoff into the underlying soil. Figures 4A and 4B are photographs of infiltration BMPs, integrating stormwater management into the overall site design and landscaping.

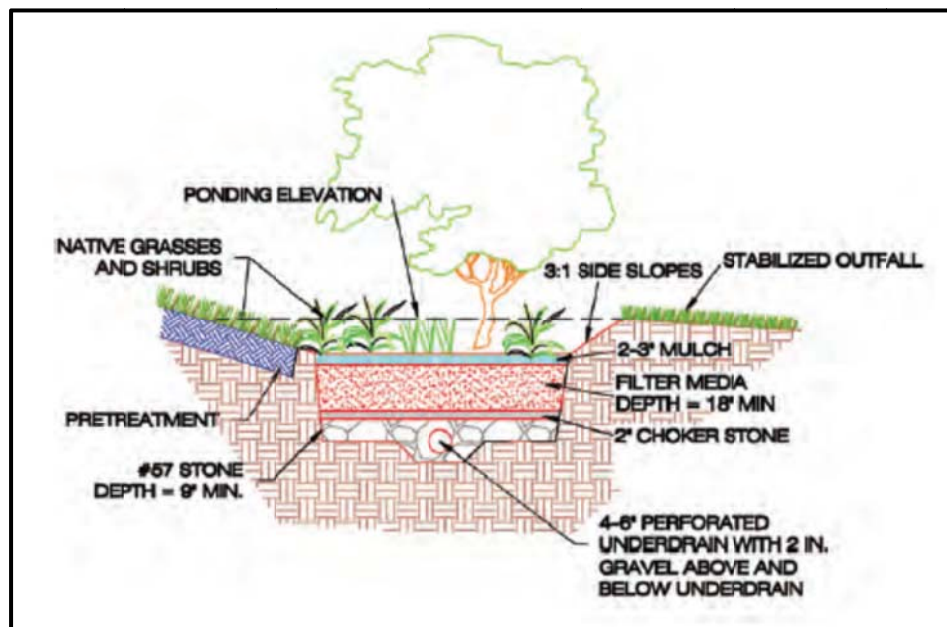


Figure 3: Cross-sectional diagram of an infiltration BMP



Figures 4A and 4B: LID BMPs treating urban parking lot runoff

Types of Stormwater Controls



In summary, stormwater controls can be categorized according to the following:

- I. Water Quantity – Peak Flow (rate) control, Volume control
- II. Water Quality – Treatment control (pollutants)
- III. Combination of Quantity and Quality Controls

Modern stormwater management and LID require (III), a combination of water Quantity and Quality Controls. There are a large number of types of BMPs and controls, and these controls can be implemented in a variety of ways. Designs are strongly influenced by **site characteristics**, such as:

- Topography
- Soils and underlying geology
- Groundwater
- Proximity of wetlands or other water bodies
- Climate and weather patterns
- Natural resources and wildlife
- Existing vegetation



Figure 5: Residential LID

Because improperly managed stormwater has the potential to impact public health and safety, and/or cause damage to property, a number of laws and regulations have been adopted. These federal, state and local requirements are intended to provide guidance and limitations for the design and management of stormwater systems, and implementation is ultimately done at the local level. The following paragraphs summarize the most important requirements which relate to development and redevelopment within the City of Charleston.

Legal Drivers and Implementation

Congress adopted the **Clean Water Act (CWA)** in 1972. This law established a framework for managing water bodies in the United States, including classification of waters, water quality standards, and beneficial uses of waters. Since that time, the US Environmental Protection Agency (EPA) has adopted a number of regulatory requirements, including the **National Pollutant Discharge Elimination System (NPDES) Permit Program**, to address pollutant sources from both stormwater and wastewater. CWA authority has been delegated to most of the states, including South Carolina, to manage water resources at the state level. The state of South Carolina administers the NPDES permit program, and delegates much of the local implementation and enforcement responsibility down to the municipalities.

The **State of South Carolina** has enacted several stormwater regulations and general permits. These are targeted at specific industries and activities known to contribute to stormwater pollution.

- SC Construction General Permit (CGP) (2013)
- SC Small Municipal Separate Stormwater Sewer System (MS4) Permit (2014)



- SC Regulation 72-300 through 72-316, Standards for Stormwater Management and Sediment Reduction (2002)

The **City of Charleston** has been designated as a “Qualifying Local Program” with responsibility for implementing the above-listed NPDES permits and state regulations. Accordingly, in recent years, the City has adopted a stormwater and floodplain Ordinance (Chapter 27 of the City Code), established stormwater Design Standards, and has developed a Charleston-specific municipal Stormwater Management Plan (listed below).

- City of Charleston Stormwater Management and Flood Control Ordinance (2013)
- City of Charleston Stormwater Design Standards Manual (SWDSM) (2013)
- City of Charleston Stormwater Management Plan (SWMP) (2014)

These standards address the design, construction and management of stormwater BMPs and the collection and conveyance system within the City of Charleston. Each of the aforementioned state of SC and City of Charleston stormwater requirements have been examined and analyzed with regards to **new development and redevelopment**. This analysis is presented in Section 2. Additional detail regarding each of the City and State requirements, including direct excerpts from the Design Standards, can be found in Sections 4 and 5.

Note: The City is also responsible for implementing national floodplain regulations established by the Federal Emergency Management Agency (FEMA). These regulations are addressed under the 2013 Ordinance, and do impact new development and redevelopment, however they will not be revised and as such, are not discussed in this Executive Report.



SECTION 2 - STORMWATER REDEVELOPMENT IN CHARLESTON

The City of Charleston encourages redevelopment and infill of previously developed areas, and needs design and zoning standards which appropriately direct this redevelopment. Many of the older areas of the City, in particular West Ashley, were developed during a time of traditional stormwater management. Redevelopment provides an opportunity to upgrade and modernize the stormwater system, restore natural function, and provide an aesthetic amenity.

Analysis of the City's existing stormwater management standards and discussions with City staff regarding redevelopment have identified a number of issues, listed below:

1. **Existing City stormwater design standards do not differentiate** between new development and redevelopment.
2. **Existing City standards are primarily flowrate-based, temporary detention standards.** Rate controls are specified for water quantity. Rate and volume controls are specified for projects in Church Creek basin only (and any other Special Stormwater Management Areas to be designated in the future).
 - Temporary detention and rate controls reduce flood damage, however they do not reduce the large *volumes* of runoff generated by impervious surfaces and provide minimal treatment for pollutants.
 - For a built-out site, the post-development runoff rate will not change much from the pre-development condition, therefore the requirement to match post-development rates to pre-development rates has minimal effect and does not require the developer to upgrade the site's stormwater management. The standard only requires that the runoff rate is not exacerbated by redevelopment.
3. **Pre-development site condition and timeframe are not defined.** If the previous site condition was more developed (more impervious) than the current site condition (ie: the site has been demolished and re-vegetation has occurred), developers request to consider the pre-development condition of the site as the more developed condition.
 - This is advantageous to the developer in that it reduces stormwater management requirements, and results in a lost opportunity for the City to upgrade the site.
 - Current City SWDSM requirements do not precisely define the *pre-development* timeframe or the threshold at which a site is considered previously developed.
 - City Engineering staff define pre-development as the condition as of the day before submittal of plan review package. The project is considered redevelopment if there is any amount of prior development on the site.
4. **Unclear terminology creates confusion, loopholes, unintended outcomes.** Existing SWDSM does not clearly define key terms such as: special protection area vs. special



stormwater management area; pre-development vs. pre-project; new development vs. redevelopment; detention vs. retention; etc.

5. **Existing site conditions make quantity controls difficult, infeasible, or undesirable for some sites.** This includes sites with small parcel size, city streetscape, shallow water table, poor soil characteristics, etc.
 - Current SWDSM uses an all or nothing approach. Smaller scale BMP implementation or other adaptations providing flexibility for sites with difficult site conditions would be possible with revised standards.
6. **Existing City standards specify temporary “store and release” of a “water quality volume”.** This treatment requirement, and the specified volume, differs depending upon the situation (structural controls or ponds; engineered treatment devices; infiltration devices; projects in Church Creek Basin or other Special Stormwater Management Areas to be designated in the future; and/or projects near shellfish beds).
 - Differing volume requirements creates confusion for designers.
 - “Store and release” treatment does not reduce overall volume of runoff. This tends to result in installation of basic filtration devices and a proliferation of traditional ponds, even for sites where more effective BMPs are feasible.
7. **Existing City standards specify “retention” for projects in the Coastal Zone only.**
 - “Retention” is defined in the SWDSM as collection and storage of runoff, without subsequent discharge. This standard would be beneficial throughout the City.
 - Coastal Zone projects have different requirements for volumes to be retained, for entire site vs. built upon area. This distinction is not made elsewhere in the SWDSM and would be beneficial.
8. **Existing City and State water quality standards are vague.** The City’s current SWDSM requires treatment for sites larger than 1-acre, for both new development and redevelopment. The MS4 permit requires treatment of 1-inch volume for new development, and specifies treatment as necessary for redevelopment, however it only specifies “improving the pre-development hydrology.” The CGP requires treatment via undisturbed buffer areas, during construction only. Buffers are also required under the City’s current SWDSM for projects discharging to impaired waters.
 - Revised standards specifying volume retention/reduction and water quality treatment, and with more specifics regarding types, location, sizing and other design requirements for a greater variety of BMPs would result in improved water quality as well as improved pre-development hydrology for redevelopment sites.



SECTION 3 - STORMWATER REDEVELOPMENT OPTIONS

After analyzing the City of Charleston's current requirements for redevelopment, it is instructive to take a look at national guidance regarding stormwater and redevelopment, and then to **compare the City of Charleston's requirements to stormwater redevelopment requirements in other cities, counties and states in the region.**

A variety of options are available for managing stormwater on redevelopment sites, depending upon site conditions. Standards should be selected based on the goals of the City (flooding, water quality, green space, aesthetics, impaired waters, etc.) New development and redevelopment standards are typically tiered or cascaded with overarching site considerations addressed first. Then for redevelopment sites, the most effective standards can be established for sites with ideal conditions, followed by more flexible standards for sites with difficult site conditions, or where the City desires to encourage redevelopment.

Design standards should be structured to account for the following types of requirements and overarching site considerations:

- Natural resources (wetlands, riparian buffers, wildlife habitat)
- Impaired waters
- Flood control and channel protection (peak flow rates and velocities)
- Runoff reduction (volume)
- Water quality (treatment)

Design standards which encourage runoff reduction (volume) via on-site retention, infiltration and LID are suitable for sites with ideal conditions. Ideal site conditions include the following:

- Clean soils with good infiltration
- Deeper water table
- Lower density suburban areas
- Sufficient space on-site
- Few site constraints

Design standards with flexible requirements are appropriate for sites with more difficult conditions and where runoff reduction and infiltration are infeasible. Difficult site conditions include the following:

- Small sites
- High density urban areas
- Desire to maintain character of streetscape
- Poor or contaminated soils
- Geotechnical hazards
- Shallow water table
- Complex existing infrastructure or other constraints



On the following pages, a series of tables presents redevelopment standards for consideration in the City of Charleston:

- **Table 1: Overarching Redevelopment Considerations**
- **Table 2: Redevelopment Standards Based on Site Conditions**
- **Table 3: City and State Stormwater Redevelopment Standards Comparison**
- **Table 4: Redevelopment Standards Comparison for SC Municipalities**

Table 1 presents overarching redevelopment considerations, based on national guidance for stormwater and redevelopment. **Table 2** presents more specific redevelopment requirements by site condition, also based on national guidance, and categorized accordingly to the specific technical requirements. This same categorization is used in **Table 3**, to compare redevelopment standards for various cities, counties and states in the Southeast region. Finally, **Table 4** presents a list of the South Carolina coastal communities which have adopted redevelopment standards more stringent than existing South Carolina state requirements. SC standards are less stringent than surrounding states, and none of the cities or counties in the Charleston metro area have yet adopted standards more stringent than the state standards. The City has an opportunity to lead in modern stormwater management.

Table 1: Overarching Redevelopment Considerations

REDEVELOPMENT CONSIDERATIONS	HOW TO IMPLEMENT
Natural Resources	- Overarching considerations regarding conservation easements, riparian buffers, wetlands, open space, reforestation, soil conservation, etc.
Impaired Waters	- Pollutant load-based standards, where applicable, or - Cumulative effect of BMP implementation strategy
Groundwater Recharge	- Where applicable
Water Quantity – Flood Control and Channel Protection (flow rate and velocities)	- Maintain stable channels and control flow rates for large storm events, where applicable - May require downstream analysis for large drainage areas - Incorporate with floodplain requirements
Water Quantity – Runoff Reduction (volume)	- Hydrograph-based volume capture and retain on-site - <i>Assumes retention-based (volume) standard for new development</i>
Water Quality (treatment)	- LID implementation; infiltration BMPs required and feasible



Table 2: Redevelopment Standards based on Site Conditions

REDEVELOPMENT STANDARDS	SITE CONDITIONS	HOW TO IMPLEMENT
Water Quantity – Runoff Reduction	Ideal Conditions	- Require entire post-development volume to be captured
	Difficult Conditions	- Require x % of post-development volume to be captured, or demonstrate maximum achievable
Design Storm	Ideal Conditions	- Specify 2-yr, 24-hr storm or 80 th /85 th /90 th percentile
	Difficult Conditions	- Allow 1-yr, 24-hr storm or less than 80 th /85 th /90 th percentile storm
Water Quality	Ideal Conditions	- Require entire post-development volume to be treated via on-site infiltration
	Difficult Conditions	- Allow Flow-through BMPs (filtration) where infiltration is not possible, or to treat volume remaining that cannot be infiltrated
		- Allow reduced sizing for Microscale BMPs (smaller design storm)
		- Establish a prioritized suite of BMPs for difficult site conditions based on site and soil characteristics
Impervious Surface Thresholds	Both	- Establish a minimum % pervious
		- Establish a maximum % impervious
		- Require reduction of x % impervious
		- Disconnection of impervious surfaces
		- Increase of < 50% impervious surface , capture and treat runoff from new and/or replaced areas
		- Increase of > 50% impervious surface , capture and treat runoff from entire site (new, existing and replaced impervious surfaces)
		- Capture and treat runoff from x % of existing impervious surfaces plus any new impervious surfaces
Green Space and Urban Tree Planting	Both	- Require addition of x % tree canopy - Require soil amendments and tilling to restore soil capacity for infiltration and plants in green spaces
Financial	Difficult Conditions	- Impact Fees - In lieu of Fees or Offset Fees
Off-Site Mitigation	Difficult Conditions	- Privately owned land elsewhere in the watershed - City/County mitigation project (wetlands, stream restoration, stormwater retrofit, other)



Table 3: City and State Stormwater Redevelopment Standards Comparison:

REDEVELOPMENT REQUIREMENTS	MARYLAND	VIRGINIA	NORTH CAROLINA	GEORGIA	SOUTH CAROLINA	FLORIDA
Definition of Redevelopment	Considered redevelopment if 40% imperv. Requirements apply for all existing imperv areas within limits of disturbance	Prior developed lands. Net increase in imperv area, apply new development standards to new areas of redevelopment site	Any land disturbing activity that does not result in a net incr in built-upon area and provides greater or equal stormwater control than previous dev	Structural dev, create/add/replace imperv surfaces, and land disturb assoc with structural/imperv dev on a previously developed site	Land disturbance that alters current use of land but does not necessarily alter pre-dev runoff characteristics (SC Reg 72-300)	Not specified. State-level design standards not specified.
General Comments	Flexible options: Reduce imperv area by 50% or provide treatment for 50% existing imperv area, or combination	Focus on Chesapeake Bay watershed	Standards established by River Basin and water classif. Reqs based on density	Coastal communities adopted more strict standards; adopted statewide in 2016.	LID in Coastal SC; Planning and Design Guide best reference	State law requires 80% reduction of avg ann pollutant load that would cause violation of WQS; 95% for ORW; not achieved
Runoff Reduction (volume)	Recharge volume fraction of WQ vol depending upon soil group	Reqs increase for increased impervious areas and decrease for sites < 1 ac.	1" statewide 1.5" coastal Rate 1-yr, 24-hr storm. Drawdown 48-120 hrs	First 1" volume removed	Recommends 1" but not required	Required drawdown 72 hrs
Water Quality	WQ volume 1" eastern zone, 0.9" western zone. Area adjusted based on % imperv	BMPs required phosphorus load reductions 10-20%	Neuse Basin max Nitr 3.6 lb/ac/yr; Tar-Pam Basin max Nitr 4 lb/ac/yr, max Phos 0.4 lb/ac/yr. Redev in Tar-Pam reduce Nitr by 30%, no net incr in P load. Rem basins 85% TSS removal	Treat remaining Vol x 1.2 with 80% TSS load removal	Recommendations only	1" or 2.5"x% imperv, whichever is greater (SJRWMD and SFWMD only); pond depth not to exceed anoxic depth
Channel Protection (Peak flowrate)	Provide extended detention volume for 1-yr, 24-hr storm. N/A for tidal discharges	Peak rate 20% less than predev rate x ratio of pre-post-dev runoff vol for natural channels	Not specified as such. Riparian buffer and various setback reqs apply	1-yr, 24-hr storm, energy dissipation and preservation of stream buffer	Not specified as such	Not specified
Flood Control (Peak flowrate)	Opt: control peak discharge from 10-yr storm to pre-dev rate. Dev excluded from 100-yr floodplain. Eastern Shore: control peak disch for 2-yr storm.	Peak discharge match pre-dev rate, 10-yr, 24-hr storm. Impounding structures designed to withstand 100-yr, 24-hr storm.	FEMA requirements	25-yr, 24-hr rate (overbank prot) 100-yr, 24-hr (extreme events)	Reduce discharge velocities to non-erosive velocity or 10-yr, 24-hr storm pre-dev rate, whichever is less (SC Reg 72-307, specifies for CGP)	Established in each WMD for canals, etc.
Green Infrastr. Credits or Mitigation Credits	X	✓	✓	✓	X	X
Offset Fees	X (off-site BMP alt)	✓	✓	✓	X	X
Latest edition	2009	2013	2007	2016	2014	2005



Table 4: Redevelopment Standards Comparison for SC Municipalities

MUNICIPALITY	STORMWATER VOLUME CONTROL
Beaufort County Includes City of Beaufort and Town of Port Royal	All stormwater from the 95 th percentile storm (1.94 inches) must be retained on site.
Town of Bluffton	In areas of Hydrologic Soil Groups A&B, the development shall control and infiltrate the first one inch of stormwater runoff from the entire development or maintain the pre-development hydrology for the Water Quality Design Storm Event (95th percentile storm = 1.95 inches), whichever is greater.
Horry County	Three Options: 1. Redevelopment projects must achieve a 10% reduction in runoff volume (from pre-redevelopment levels). 2. Reduce impervious cover on the site by at least 20%. 3. Reduce the post-development peak discharge rates by 20% for the 10- and 25-year, 24-hour storms.
Jasper County	The 85 th percentile storm (1.2 inches) must be retained on site.
City of Myrtle Beach	As a minimum, the first inch of rainfall from each storm over the developed portion of the site shall be retained on site.
City of North Myrtle Beach	Minimum storage volume shall be provided to retain on-site the first inch of runoff generated by any storm event over the developed or redeveloped portion of the site.
Town of Hilton Head	The first flush runoff (0.5 to 1.0 inch) from paved streets and parking areas shall be filtered through vegetation, grass, gravel, sand or other filter mediums to remove oil, grease, gasoline, particulates and organic matter is required before the runoff leaves the site or enters any natural or manmade waterbody.
Town of Surfside Beach	As a minimum, adequate storage volume shall be provided to retain on-site the first inch of runoff generated by any storm event over the developed or redeveloped portion of the site.
MUNICIPALITY	PEAK STORMWATER CONTROL
Horry County	Projects greater than 5 acres or redevelopment projects must reduce post-development peak discharge by 20% for the 10-year and 25-year storms.
City of Hardeeville	The post-development peak discharge shall not exceed the pre-development peak for developments from 0-299 acres (25-year storm); over 300 acres (50-year storm).

Reprinted from *Low Impact Development in Coastal South Carolina: A Planning and Design Guide*, 2014.

Note: The City of Charleston's Stormwater Management Plan states an intent to adopt post-construction site performance standards to require treatment of the first 1-inch of runoff from *impervious areas* on new development and *redevelopment* sites.



Pre-development Considerations and Options

- Pre-development may be defined in a variety of ways, depending upon the relative amount and timing of land disturbance. The pre-development condition in turn impacts the redevelopment requirements.
- Pre-development may be defined as “pre-project” (the soil, vegetation and impervious conditions present immediately prior to submission of a project to the City).
- Pre-development may be defined as “pre-Columbian” (the native vegetation and soil conditions prior to the arrival of settlers in North America).
- Pre-development may be defined for a certain timeframe (number of years) prior to submission of a project to the City (thus allowing flexibility to the applicant for site status changes).
- Pre-development may also be defined according to a certain threshold of acreage, or of overall development, such that prior development greater than, for example, 20% of a site, triggers redevelopment requirements, but prior development less than 20% of a site would instead trigger new development requirements.
- Sites with prior development often have altered soil types and compaction, and potential contamination, therefore soil borings and testing are needed in order to determine existing site conditions.
- Pre-development should be clearly defined in the design standards and aligned with desired zoning densities and style of development in a particular area. Different pre-development definitions could be used for redevelopment quantity and quality criteria.

Redevelopment Considerations and Options

There are a number of ways the City of Charleston can implement redevelopment standards. This may include:

- Adding a requirement for runoff reduction (volume)
- Selecting a more stringent design storm (in order to require a larger amount of stormwater to be managed)
- Capping the allowable percentage of impervious surface or requiring a certain amount of green space on a site (in order to reduce generation of runoff)
- Adding a requirement for channel protection
- Considering the use of impact fees, in lieu of fees, or off-site mitigation or other credits

Preliminary Recommendations

Successful standards should define the terms new development, redevelopment and pre-development, as well as detention and retention. They should establish a minimum disturbance footprint and state whether the requirements apply to the entire site, disturbed area or impervious areas. A timeframe should be established for when the new standards will apply. Standards should also establish a threshold for switching from a runoff reduction (infiltration)



requirement to a water quality treatment (filtration) requirement, or to allow an in lieu of or offset fee or mitigation. Successful standards should be flexible enough to encourage responsible redevelopment while discouraging new impervious surfaces.

Design standards should establish a tiered system for acceptable BMPs. Use of infiltration BMPs in site design is dependent on site soil characteristics, therefore implementation of infiltration BMPs should be on a site-specific basis with feasibility criteria. Site investigation and soil testing should be required in order to determine the appropriate tier. For acceptable soils, infiltration can be allowed. If site soils are too compacted or contaminated, or if site activities are likely to produce spills or contamination in the future, design standards should require filtration BMPs with liner and prohibit any discharge to the groundwater or subsurface.

Design standards should establish prioritization for urban and suburban BMPs. LID BMPs are more easily implemented in suburban and new development areas. High density urban and redevelopment areas require more space-efficient BMPs that make use of existing hardscape (rooftops, sidewalks, plazas, etc). A prioritization ranking system should be established for allowable BMPs in the more urbanized areas, and in suburban areas, separately.



SECTION 4 - CURRENT CITY OF CHARLESTON STANDARDS

Types of Stormwater Controls:

- I. Water Quantity – Peak Flow (rate) control, Volume control
- II. Water Quality – Treatment control (pollutants)
- III. Combination of Quantity and Quality Controls

Legal Drivers for City of Charleston Stormwater Standards:

- City of Charleston Stormwater Management and Flood Control Ordinance (2013)
- City of Charleston Stormwater Design Standards Manual (SWDSM) (2013)
- City of Charleston Stormwater Management Plan (SWMP) (2014)
- SC Construction General Permit (CGP) (2013)
- SC Small Municipal Separate Stormwater Sewer System (MS4) Permit (2014)
- SC Regulation 72-300 through 72-316, Standards for Stormwater Management and Sediment Reduction (2002)

The following text is directly excerpted from the City's SWDSM, with page numbers referenced at the end of each item. Several items have been condensed in the interest of brevity. Part (I) Water Quantity and part (II) Water Quality requirements are each broken out according to (A) Minimum Requirements for all Projects, and (B) Requirements for Special Stormwater Management Areas. Part (III) shows the Quality and Quantity controls combined and explains the requirements for Special Stormwater Management Areas.

I. WATER QUANTITY

The following bullets summarize the water quantity and quality requirements found in the City of Charleston's SWDSM, unless otherwise noted:

A. Minimum Requirements for all Projects

- Runoff Rates: Post-development discharge rates shall not exceed pre-development discharge rates for the 2, 10 and 25-yr frequency, 24-hr duration storm. (pg 3-8)
- Discharge Velocity: Post-development discharge velocity shall be reduced to provide non-erosive flow velocities from structures, channels or other control measures, or shall equal the pre-development discharge velocity for the 10-yr, 24-hr storm event, whichever is less. (pg 3-10)
- Underground Detention Systems: Post-development discharge velocities shall be reduced to provide non-erosive flow velocities from structures, channels or other control measures, or shall equal the pre-development 10-yr, 24-hr storm velocities, whichever is less. (pg 3-9)
- Recovery Time: Detained volume from all controls shall be drained from the structure within 72 hours. (pg 3-10)



- Ponds: Runoff is detained above the permanent pool elevation and released at a designed flow rate to reduce the downstream water quantity impacts. (pg 3-13)
- 100-yr, 24-hr storm event: Shall be used to check all drainage designs for local flooding and possible flood hazards at adjacent structures and/or property. (pg 3-35)

B. Requirements for Special Stormwater Management Areas

- Church Creek Basin - Systems shall be designed and constructed to maintain the post-development peak flow rates at or below the pre-development peak flow rates, and to detain the excess runoff volume for the 2, 10, 25, 50 and 100-yr frequency storms, with duration of 24-hrs. System must detain for a period of 24-hrs, with tolerances for a peak flow rate match for the 25 and 50-yr storm events being $\pm 10\%$, with all others matching pre-development conditions. Detention facilities shall contain the excess volume for the 24-hr period, and the volume required to release the post-development peak flow rates at or below the pre-development peak flow rates. (pg 3-4)
 - Note: pg 3-4 says Special Stormwater Management Area (Church Creek Basin) requirements only apply to new development, however pg. 3-5 states that redevelopment projects shall be governed by the same design criteria as new development, which would include redevelopment in Church Creek basin and any other Special Stormwater Management Areas. This conflict will be clarified in the next SWDSM update to ensure redevelopment standards will apply in Church Creek Basin.
- Areas identified with flooding: The peak discharge rate is restricted to $\frac{1}{2}$ of the pre-development rates for the 2 and 10-yr, 24-hr storm, or to the downstream capacity of the system, whichever is less; and the post-development runoff volumes for the 2-yr, 24-hr duration storm events above the pre-development level shall be stored for a period of 24-hrs on average before release. (pg 3-45)



II. WATER QUALITY

A. Minimum Requirements for all Projects

- Structural and Nonstructural Controls [generic statements]: Stormwater runoff from construction, development and *redevelopment* shall be treated through the use of structural and nonstructural practices. (pg 3-5) Any water quality structures shall be designed to accommodate at least ½-inch of runoff from the entire site. (pg 3-22)
- Water Quality Control Threshold: All sites which disturb one acre or greater shall have at least one permanent water quality structural BMP installed. (pg 3-22)
- Water Quality Volume: Permanent water quality ponds/structures with a permanent pool elevation shall be designed to store and release the first ½-inch of runoff from the contributing area over a minimum period of 24-hrs. Permanent water quality structures without a permanent pool elevation shall be designed to store and release the first 1-inch of runoff from the site over a minimum period of 24-hrs. (pg 3-22)
- Shellfish Beds: For a project located within 1,000 ft of shellfish beds, the water quality structure shall be designed to store and release the first 1½-inches of runoff from the site over a period of a minimum of 24-hrs. (pg 3-22)
- Coastal Zone: Projects within ½-mi of a receiving water in the Coastal Zone must show that the first ½-inch of runoff from the *entire site*, or the first 1-inch of runoff from the *built-upon area*, whichever is greater, can be stored on-site. (pg 3-22)
- Engineered Devices: The water quality volumes listed above may be waived if treatment is instead provided by engineered devices. The device must capture an equivalent amount of runoff as that captured by a dry pond with a volume capture of 1-inch. (pg 3-22)
- Infiltration: Devices may be required on those sites which do not currently discharge stormwater runoff, have no existing outlet, or are in the Church Creek basin (ie: limits volume increases). In the post-development condition, devices shall be designed to infiltrate the runoff volume equivalent to the 2-yr, 24-hr storm, in 24 hrs. For the 10-yr and 25-yr, 24-hr storms, the discharge rate shall not exceed that of a site of equivalent size and slope with an SCS curve number of 39. (pg 3-11)



- Impaired Waters: Projects that discharge directly or indirectly into an impaired water body shall be required, via the installation and implementation of measures, structural or non-structural BMPs, to reduce pollutant loads to levels required by the Total Maximum Daily Load (TMDL). (pg 3-22)
 - Not applicable in City of Charleston because the Ashley River/Cooper River/Charleston Harbor TMDL has not assigned loads to the City.
- Post-Construction Standards: City of Charleston's Stormwater Management Plan states an intent to adopt post-construction site performance standards to require treatment of the first 1-inch of runoff from *impervious areas* on new development and *redevelopment* sites. (SWMP, section 4.5.2).
 - These standards will be incorporated to the upcoming SWDSM update.

B. Requirements for Special Stormwater Management Areas

- Areas associated with TMDLs and Impaired Waters: Must meet water quality requirements listed above. Buffers are required to be established along perennial and intermittent streams adjacent to the project in a watershed where there is an established TMDL, and for other waters as dictated by the City. Base width is 50 ft plus 2 ft per 1% slope of the stream. All sources of contamination and degradation shall be excluded from buffer areas. (pgs 3-45, 3-46)

III. COMBINATION OF QUANTITY AND QUALITY CONTROLS

The City's Stormwater Ordinance and Design Standards call for the designation of "Special Stormwater Management Areas." This term has been defined as follows:

"...areas which require additional control of stormwater quality and quantity than that provided by minimum design standards. Such areas may consist of watersheds corresponding to adopted TMDLs, known flooding problems and pollutant impairments, or other areas necessary to protect, maintain, and enhance water quality and the environment of the city and the public health, safety, and general welfare of the citizens of the city."

Currently Church Creek Basin in West Ashley is the only area in the City to have been designated as a Special Stormwater Management Area. Church Creek Basin requirements are listed below.

The City of Charleston has initiated a series of watershed assessment studies, intended to update the Master Drainage Plan, evaluate existing conditions, model the system and make recommendations for improvements. Customized design standards for each watershed area and designations for Special Stormwater Management Areas will be included in the recommendations.

- Church Creek Basin - Systems shall be designed and constructed to maintain the post-development peak flow rates at or below the pre-development peak flow rates,



and to detain the excess runoff volume for the 2, 10, 25, 50 and 100-yr frequency storms, with duration of 24-hrs. System must detain for a period of 24-hrs, with tolerances for a peak flow rate match for the 25 and 50-yr storm events being $\pm 10\%$, with all others matching pre-development conditions. Detention facilities shall contain the excess volume for the 24-hr period, and the volume required to release the post-development peak flow rates at or below the pre-development peak flow rates. (pg 3-4)

- **Note:** pg 3-4 says Special Stormwater Management Area (Church Creek Basin) requirements only apply to new development, however pg. 3-5 states that redevelopment projects shall be governed by the same design criteria as new development, which would include redevelopment in Church Creek basin and any other Special Stormwater Management Areas. This conflict will be clarified in the next SWDSM update to ensure redevelopment standards will apply in Church Creek Basin.
- Areas identified with flooding: The peak discharge rate is restricted to $\frac{1}{2}$ of the pre-development rates for the 2 and 10-yr, 24-hr storm, or to the downstream capacity of the system, whichever is less; and the post-development runoff volumes for the 2-yr, 24-hr duration storm events above the pre-development level shall be stored for a period of 24-hrs on average before release. (pg 3-45)
- Areas associated with TMDLs and Impaired Waters: Must meet water quality requirements listed in B above. Buffers are required to be established along perennial and intermittent streams adjacent to the project in a watershed where there is an established TMDL, and for other waters as dictated by the City. Base width is 50 ft plus 2 ft per 1% slope of the stream. All sources of contamination and degradation shall be excluded from buffer areas. (pgs 3-45, 3-46)



SECTION 5 - CURRENT STATE OF SOUTH CAROLINA STANDARDS

Types of Stormwater Controls:

- I. Water Quantity – Peak Flow (rate) control, Volume control
- II. Water Quality – Treatment control (pollutants)
- III. Combination of Quantity and Quality Controls

Legal Drivers for State of SC Stormwater Standards:

- SC Construction General Permit (CGP) (2013)
- SC Small Municipal Separate Stormwater Sewer System (MS4) Permit (2014)
- SC Regulation 72-300 through 72-316, Standards for Stormwater Management and Sediment Reduction (2002)

Several State of South Carolina NPDES Permits and Regulations contain design requirements from the above-listed sources. The following text is directly excerpted from the State requirements, with sections referenced at the end of each item. Several items have been condensed in the interest of brevity. Standards are presented by (I) Water Quantity, (II) Water Quality, and (III) Combined Quality and Quantity Controls, in parallel with the City Standards in the previous section. Note: Many of the MS4 requirements are new, and will be included in the upcoming SWDSM update.

I. WATER QUANTITY

- Required volume and rate control are specified for *during construction* only. (CGP, section 3.2.10)
- Basic post-development rates for conveyance and discharge velocity are stated in SC Reg 72-307 and CGP (sections 3.2.6 and 3.2.7), and are already reflected in the City's current SWDSM.
- Post-Construction BMPs are not mandated by the CGP, however both SC Reg 72-307 and CGP (section 3.2.8) provide basic design guidelines for when permanent BMPs are included in a site design and CGP submittal.
- Discharge velocities shall be reduced to provide a non-erosive velocity flow from a structure, channel, or other control measure or the velocity of the 10-year, 24- hour storm runoff in the receiving waterway prior to the land disturbing activity, whichever is greater. (SC Reg 307)

II. WATER QUALITY



- Water Quality Controls [generic statements]: Controls are required in order to reduce discharge of pollutants from new development and *redevelopment* sites that disturb at least one acre and which discharge into an MS4. (MS4, section 4.2.5)
- Controls must meet the performance standards (approximate pre-development conditions) to the maximum extent practicable. (MS4, sections 1.5 and 4.2.5)
- Controls are required for discharges to impaired water bodies. (MS4, section 3.4)
- Controls are required for discharges to specific classifications of waters. (MS4, sections 3.5 and 3.6)
- Buffer Zones: Undisturbed buffer zone of 30-ft is required during construction if surface waters are located on or immediately adjacent to the construction site. Extended buffer of 45-ft is required for sensitive waters. Reduction of the buffer width, or elimination of the buffer, are allowed under certain circumstances. (CGP, section 3.2.4.C)

III. COMBINATION OF QUANTITY AND QUALITY CONTROLS

- Water Quality Treatment Volume: *New development* standards can be one or a combination of design strategies, controls, practices or provisions that demonstrate the runoff reduction and pollutant removal necessary to approximate pre-development conditions. *The first 1 inch of runoff must be addressed.* (MS4, section 4.2.5)
- Site Performance Standards: MS4 must describe the design strategies, controls and other practices deemed necessary to maintain, or *in the case of redevelopment improve, pre-development hydrology and protect water quality.* (MS4, section 4.2.5)



SECTION 6 - REFERENCES

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EXAMPLES

#1 Chuck E Cheese (1610 Sam Rittenburg Blvd, West Ashley)

Fully developed (100% impervious) site, a few small trees, suburban area, little to no existing management of stormwater.

#2 Abandoned site (corner of Morrison Drive and Romney Street)

Previously developed site, demolished, now compacted gravel and grass, urban area (Poor soils?) City interest in site redevelopment to have urban streetscape in keeping with area. Indirect discharge via tidal creek to Cooper River. Special consideration TMDL.



Example #1: Chuck E Cheese

1610 Sam Rittenburg Blvd, West Ashley

Site Conditions:

- 14 Acres
- Soils unsuitable for infiltration
- Suburban area, medium density development desired
- Proximity to surface waters – not close

Redevelopment Options:

- Disconnect impervious areas, drain to landscaping
- Use traditional detention basin for water quantity control
- Incorporate flow-through bioretention for water quality treatment
- Landscape site per zoning ordinance

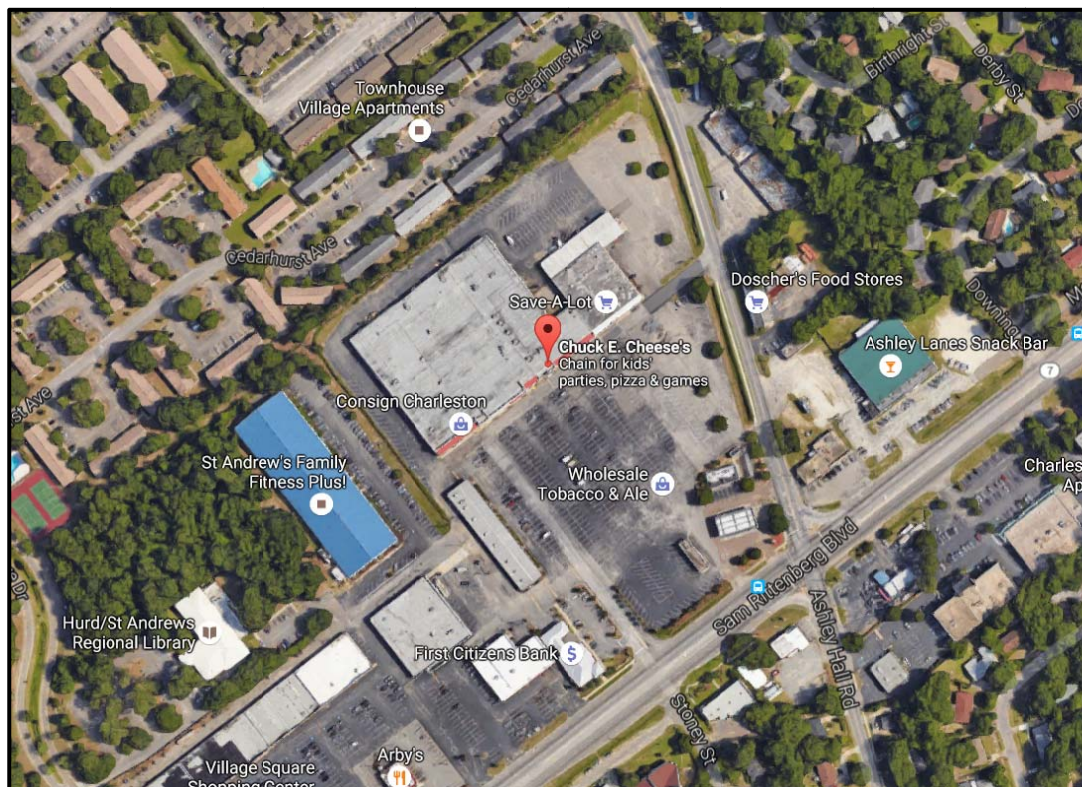


Figure 6: Comparing redevelopment options for a suburban site in Charleston



Example #2: Abandoned Site

Southeast corner of Morrison Drive and Romney Street

Existing Conditions:

- 3.5 acres
- Soils unsuitable for infiltration
- Urban area, high density development desired
- Proximity to surface waters – very close

Redevelopment Options:

- Disconnect impervious areas, drain to landscaping
- Use traditional or reduced requirement for water quantity
- Use permeable pavement in parking stalls, flow-through filtration tree box planters or green roof for water quality treatment
- Landscape site per zoning ordinance

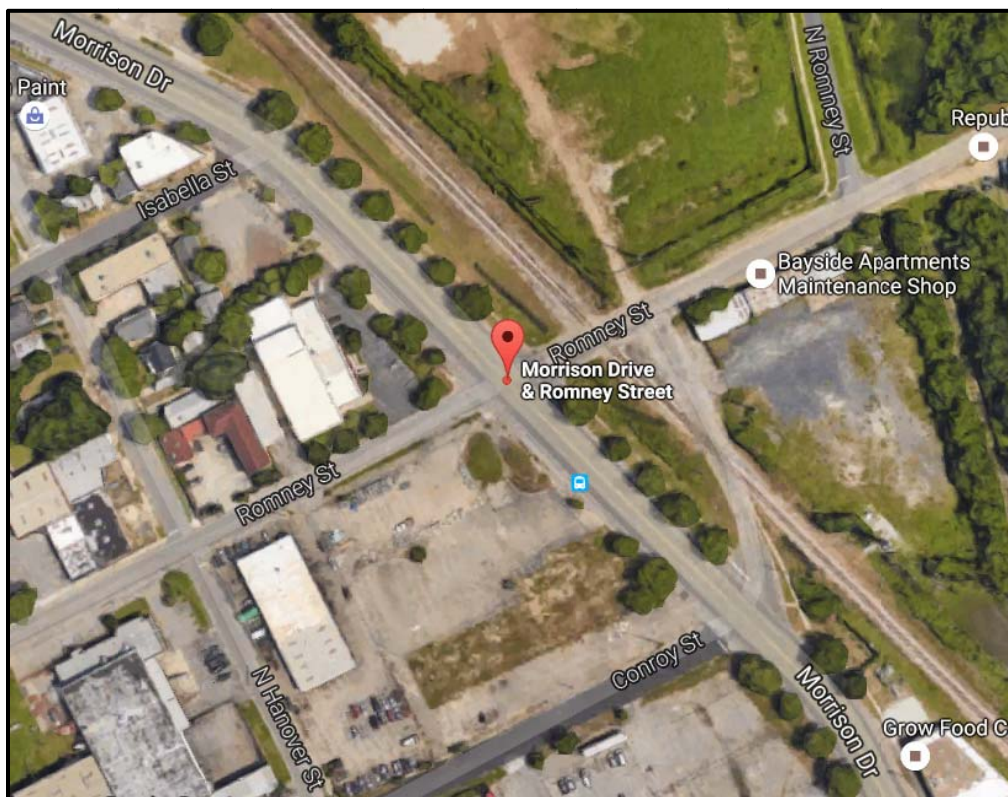


Figure 7: Comparing redevelopment options for an urban site in Charleston

